

8-1-08

ASARCO

**MONTANA CULTURAL RESOURCES INFORMATION SYSTEM (CRIS) FORM**

**1. IDENTIFICATION**

*\*required to receive Smithsonian number*

1.1 Smithsonian Number: 24LC2036

1.2 Field Designation:



1.3 Project Name: East Helena Smelter Demolition Project

1118531 - R8 SDMS

1.4 Agency Project Number:

1.5 Consultant Project Number: MH000980.0001

**2. LOCATION**

\*2.1 Township: 10 N Range: 3 W Section: 36 1/4 Section(s): NE, ,

\*2.2 County: Lewis and Clark

\*2.3 UTM Coordinates: Zone 12 E m; N m

\*Datum used: ☐ NAD 83 conus

\*2.4 Administrative/Surface Ownership: (Agency/Region/District/Office) ASARCO

\*2.5 7.5' USGS Map Name, Date: East Helena, Mont. 1985

2.6 Narrative of access: East Helena, Montana is located 5 miles east of Downtown Helena, Montana and just south of Highway 12.

2.7 City/Town: East Helena, Montana Vicinity of: 5 Miles East of downtown Helena, Montana

**3. DESCRIPTION**

\*3.1 Site Category (choose one): ☐ Prehistoric ☒ Historic ☐ Paleontological ☐ Combination ☐ Other

\*3.2 Site Type (see recommended site type list, choose all that apply): Historic Smelter

3.3 Narrative Description of Site: The interrelated growth of mining industries and railroads were key elements of the development of the Rocky Mountain West. In the late 1850s, thousands of emigrants crossed through the Rocky Mountains on their way to mining towns and new lands on the Pacific coast. Beginning in the late 1850s, gold strikes in the Rocky Mountain region diverted the westward migration and brought disappointed gold seekers and settlers back from the west coast. Mining quickly became an enterprise of large corporations dependent on the development of railroads. In the 1860s in Colorado, major investors turned their attention to lode mines and to luring major railroads to the Colorado mining districts. Capitalization also included large ore mills employing the most current technology and smelters. Even before the completion of the Transcontinental Railroad in 1869, there were smelters in operation near Blackhawk, Colorado, and Helena, Montana. From its very beginnings in the region the smelting industry was constantly attempting to remodel, adapt the most current technology, and expand capacity. Soon, new markets also emerged for base metals such as lead, nickel, and zinc, which were by-products of smelting carbonate ores of gold and silver.

In the summer of 1888 the Helena and Livingston Smelting and Refining Company began construction of a new facility along the Northern Pacific Railroad near Prickly Pear Junction. The new facility at what would become East Helena included much of the equipment from the Montana smelter at Wicks. The new facility was in full production by 1891. The original plant included six roasters, four blast furnaces, one copper matte smelting furnace, and three stacks (Stallings 2004). Over the years new technologies and new types of processing equipment were added, including the addition of sintering machines beginning in 1907. With the Silver Panic of 1893, metal prices dropped and overproduction exacerbated competition. By the late 1890s, further consolidation of operations was the only means of survival for the industry. In 1899, the American Smelting and Refining Company (AS & R Co. later ASARCO) was formed by the consolidation of a number of smelting plants, refineries and mines, including the East Helena Smelter (Stallings 2004). By 1900 the smelter at East Helena was an AS & R Co. facility operated for the production of lead and zinc.

Air quality concerns in the early years of the 20th century may have been fostered by a concern for lost profits. Baghouses constructed at the East Helena Smelter around this time provided a means of filtering metal particulates from exhaust gasses.

The 1920s were an eventful period for the smelter and the community. A 1922 newspaper article proclaimed the ASARCO smelter as the financial heart of the East Helena community and the region's mines and ore suppliers the heart of the smelter (Wilkinson 1922). Also during the early 1920s ASARCO began publishing *The Crucible* as a monthly newsletter to promote job safety. The company also constructed a nine-hole golf course to

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the east of the baseball field (Cole 1995, Kurtz 1995). The baseball field was home ground of the Montana Copper League dominating Smelterites (Cole 1995). Electric trolleys were installed for moving bullion and slag from furnaces (Tode 2001) and the furnaces were replaced (Sasek 1999). Then in 1927 the zinc recovery plant was constructed near the slag pile at the smelter (Sasek 1990).

The effects of the depression seemed to be dampened a little by the productivity of the smelter and demand for its products. During the 1930s ASARCO was the world's largest producer of lead, providing 150 million pounds annually (Byron 2007). In 1935, an earthquake toppled the top 200 feet of the 400 foot tall stack connected to the Cottrell electrostatic precipitator. Output probably faltered to some degree, but the loss of the stack appears to have been temporary and did not substantially change the smelter's capability.

America's involvement in World War II all but ended our economic depression. An influx of wartime spending and investment spurred demands for materials produced at East Helena. Women joined the ranks of smelter workers at East Helena just like other industries and communities throughout the United States. Articles published at the time illustrate the variety of tasks taken up by these members of the smelter work force. Most of the women tackled difficult, labor intensive tasks such as unloading, furnace work, and scrap iron sorting (Willard 1944, Sundby 1987). Following the war, things appear to have returned to a more even pace at the smelter and in East Helena. Most of the surviving long-time residents of East Helena and ASARCO employees grew up during this period. Very little regarding the smelter was published in newspapers at this time and suggests the smelter and its relationship with the community was uneventful. Jobs remained available at the smelter, many of them now unionized. Two events in the 1960s and 1970s represent major steps to continue the lead smelting process in East Helena in much the same way it had been pursued before then. In the early 1960s furnaces at the smelter were replaced again (Sasek 1999). Then in 1970, ASARCO purchased the zinc plant from Anaconda Copper Mining Company (Byron 2001).

The 1960s and 1970s saw numerous and far-reaching changes in American attitudes regarding health and the environment and the smelter at East Helena and ASARCO were not left out. In fact, ASARCO implemented improved methods and installed new equipment to keep pace with changes in regulation and address concern for environmental pollutants. A series of efforts to identify, control, and mitigate pollutants in East Helena began with monitoring for lead and sulfur dioxide in 1969 (Sasek 1990). This and other efforts influenced operations at the smelter for the next thirty years until regular operations ceased in 2001.

Byron, Eve

2001 Arsenic at high level. Article in Helena Independent Record, April 6, 2001. On file at the Montana Historical Society, vertical files.

2007 Deconstructing History. Article in Helena Independent Record, November 11, 2007. On file at the Montana Historical Society, vertical files.

Cole, David

1995 From the beginning it's been a company town. And Most dramatic event in town's history. Articles in Helena Independent Record, August 15, 1995. On file at the Montana Historical Society, vertical files.

Kurtz, Leanne

1995 From its first days of existence Asarco has been East Helena. Article in Helena Independent Record, August 31, 1995. On file at the Montana Historical Society, vertical files.

Sasek, Grant

1990 Residents Support Smelter. Article in Helena Independent Record, September 9, 1990. On file at the Montana Historical Society, vertical files.

1999 Asarco, The First Century. Article in Helena Independent Record, April 4, 1999. On file at the Montana Historical Society, vertical files.

Stallings, Manley K. 2004. The East Helena Smelter. In Prickly Pear Junction, East Helena's Heritage.

Sundby, Jill

1987 East Helena, A Close Look At Helena's Closest Neighbor. Article in Helena Independent Record, November 15, 1987. On file at the Montana Historical Society, vertical files.

Tode, Laura

2001 A Look inside Asarco. Article in Helena Independent Record, April 29, 2001. On file at the Montana



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Historical Society, vertical files.

Wilkinson, Raleigh

1922 East Helena Smelter. Article lacking publication info other than date. April 9, 1922. On file at the Montana Historical Society, vertical files.

Willard, John

1944 Patriotic Women Really Throw Metal At Hitler And Stooges. Article in Helena Independent Record, October 15, 1944. On file at the Montana Historical Society, vertical files.

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3.4 Site Dimensions: 160 acres

Surface visibility: n/a

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3.5 Feature Descriptions: Each feature in the investigation at the East Helena Smelter was assigned a field number. They are listed by feature name here for reference. Their assigned field numbers follow.

Feature Name and Number

Acid Decolorization Building with Sump #16

Acid Plant #34

Acid Plant Cooling Towers with Chemical Storage Tanks #10

Acid Plant Oil Shack #15

Acid Plant Shop #14

Air Receiver #20

Auto Shop-Cottrell Powerhouse #26

Baghouse Office/Control Room #36

Blacksmith Coke Storage Bin #3

Blacksmith Shop #39

Blast Furnace Baghouses #33

Blast Furnace Cooling Water Return Tanks #1

Blast Furnace Flue #31

Carpenter Shop #4

Contractor Trailer #12

Crushing Mill #37

Dust Handling System with Baghouse #21

Emission Monitoring Station #23

Fan House #40

Former Gunitite Storage Building #28

Former Paint Shop #5

Former Paint Storage Shed #6

Incinerator #7

Instrument Storage Shed #13

Lime Storage Building #19

Monier Flue #32

Ore Storage Bins #25

Overhead Acid Pipe Rack #17

Overhead Dust Handling Pneumatic Transfer Pipe #24

Overhead Ventilation Pipe #22

Pipefitter Storage Shed #2

Pump Tank Building Sump #27

Ringling Dust Building #18

Sand Filter Building #11

Sinter Stack Fan #30

Spray Dryer Building #8

Stacks #35

Truck Unloading Building #9

Weak Gas Handling Flue #29

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The Blast Furnace Flue is Feature 31 at the East Helena Smelter facility. It is 1050 feet long and encompasses much of the facility. Currently it extends SSE from the east central portion of the facility, past several maintenance buildings and shops on its eastern side, and makes a turn to the SW at the Carpenter Shop. From

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this point it continues SW toward the Spray Dryer Building, then trends toward the WSW to its junction with the Monier Flue near the Acid Plant Cooling Towers at the southwest corner of the facility. It was the principal flue used to vent gasses and suspended material from the Blast Furnace and associated operations throughout the facility and ultimately to the Baghouses. It appears on drawings as early as 1918 (ASARCO Drawing # 2979).

The northern end of the Blast Furnace Flue formerly attached to the Blast Furnace Building. The flue was truncated here and sealed when the Blast Furnace was demolished circa 2005. A cross section visible at the sealed end suggests the method of construction. Although there are no other exposed sections that reveal its construction, the balance of the Blast Furnace Flue appears similar to the remaining northern end. Based on the construction details visible in this cross section the Blast Furnace Flue was substantial in scale, construction, materials, and labor involved. The flue itself consisted of vertical walls and an arched ceiling. Additional brick used to fill the angles created by the arch at each upper corner give the rectangular appearance seen throughout its length. The exposed wall suggests the construction of the arch rested atop base courses of brick laid in a running bond pattern. The Arch is formed by three courses of brick laid in the running bond pattern to conform to an arched template placed during construction and then removed. The exposed end wall shows that finished ends of closer bricks were used to produce a finished wall surface with the arch clearly delineated. The balance of the wall surface appears to be executed in an English bond pattern where header rows are separated by three stretcher rows. The opening into the flue has been sealed with steel plate and insulating foam.

Vertical buttressing is included at most places along the flue. These were tied together above the flue with rods, beams, or timbers as needed. Some buttresses are brick, or brick faced with large timbers, steel "I" beams, or concrete. Buttress spacing is also at different intervals, sometimes 5 feet apart or on other sections at 6 feet apart.

The exterior of the Blast Furnace Flue is coated with an insulating/sealing mixture of cement and glue. This was sprayed in successive layers over time. Portions of this covering have deteriorated, scabbed off, and been repaired. A steel pipe to supply pressurized air runs the length of the flue on top. The interior of the Blast Furnace Flue is coated in some places with Portland cement.

*Cleanouts occur at various places along the flue. These consist of metal doors that can be removed and replaced, capped pipes that direct material to bins, or hopper bays accessible from an underpass. Others include earlier access points now sealed, but functional during periods when accumulated dust was removed by hand (Blaine Cox, personal communication September 8, 2008).*

The Blast Furnace Flue changes in width and height at various locations associated with underpasses. These provide openings that allow pedestrian, vehicle, and rail traffic to cross underneath the Blast Furnace Flue. At these locations reinforced concrete masonry foundations and/or columns carry the flue overhead and form the underpasses. There are five underpasses between the northern terminus of the Blast Furnace Flue and its junction with the Monier Flue.

The northernmost underpass is immediately north of the Blast Furnace Cooling Water Return Tanks and Air Receiver. It includes two bays, one for rail traffic and one for all other types. The rail bay is 9 feet high by 15 feet wide by 14 feet long. To the north of the rail bay is a second bay to accommodate other traffic, but appears to have been closed with a poured concrete wall on the north side of the flue. It measures approximately 7 feet high by 15 feet wide. An electric utility pole has been set in the southern approach to this bay, although the sign indicating the inside height remains in place above the southern entry. The next underpass is 50 feet to the south of the rail underpass. It measures 9 feet high by 10 feet wide by 14 feet long. This underpass includes a series of hoppers in the floor of the Blast Furnace Flue than can be opened to transfer material into vehicles or containers staged in the underpass. The third underpass is another 40 feet along the Blast Furnace Flue. It includes a set of hopper bays for removing dust from the flue. At the southeast corner of the Blast Furnace Flue near the incinerator is a fourth underpass. It is 12 feet high by 15 feet wide by 15 feet long.

The fifth underpass is between the Spray Dryer building and the Acid Plant Cooling Towers. This is the largest opening measuring 70 feet wide by 25 feet high by 17 feet long. It was executed in reinforced poured concrete. It is designed symmetrically to either side of a central column. The inner passage on each side of the center column is open to the bottom of the flue suspended overhead. The facades of the inner passages are formed as rounded arches at their peaks with an angular crossbeam about halfway to the ground. The ceiling of each inner passage is the underside of the flue. To the outside of the inner passages are large angular arches to accommodate railroad traffic (ASARCO Drawing # 2979). The bottom of the flue is 25 feet off the ground supporting another 20 feet of brick flue above. Interestingly, several portions of the gate here have been damaged by vehicular traffic exposing some details of construction. Among these are sections of rebar with a twisted cross section like a drill and pieces of common blast furnace smelter slag used as aggregate. The arches, passage openings, and large brick buttresses supporting the flue walls to either side of the underpass have been painted dark gray.

An abandoned and sealed intersection with other flues is visible near the southern angle of the Blast Furnace Flue. The figure shows the construction of this junction. The intersecting flue was on the far side of the Blast



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Furnace Flue and connected the Cottrell Treatment Building, according to a 1918 map of the facility (ASARCO Drawing # 2979). To the southwest of this junction the Blast Furnace Flue begins to climb up and over the railroad underpass before meeting the Monier AFlue at the southwest corner of the facility.

The intersection with the Monier Flue is a 90 degree turn to the northwest. The intersection does not appear constructed more substantially than the balance of the flue, but additional buttressing is not evident.

The Blast Furnace Baghouses (Baghouses) are Feature 33 at the East Helena Smelter facility. They are located at the west side of the facility. To their southeast are the flues that enter the Baghouses from the Distribution Flue, Fanhouse, and Monier Flue. The Baghouses are numbered 1, 2, and 3 from west to east.

There is a new Dust Handling System with Baghouse (Feature 21), concrete Baghouse Stack, and Emission Monitoring Station (Feature 23) connected to the Baghouses by an Overhead Ventilation Pipe (Feature 22) to the northwest of the baghouses. The newer features, 21, 22, and 23, are discussed elsewhere and not included in the discussion of the brick Blast Furnace Baghouses except for reference.

Apart from the towering stacks, the three brick Baghouse structures are the most visually impressive buildings remaining at the East Helena Smelter complex. Built circa 1901-2, their towering height in relation to length and breadth, solid nature of brick construction, side buttresses, and their close proximity to one another add to their imposing prominence and appear somewhat cathedral like.

The three Baghouses were designed to retrieve dust rich in metal solids from blast furnace gasses and reintroduce them to the smelting process. The gasses were fed to the appropriately named Fan House (Feature 40), which drew the gasses from the length of the flue, into the Distribution Flue, which has three separate flues to the Baghouses. The 1500 feet long Blast Furnace Flue was arranged in a "U" shape with the Blast Furnaces at the upper right arm and the Baghouses at the upper left. The captured dust could be efficiently returned to the Blast Furnaces by crossing the short distance from the Baghouses at one end straight across to the Blast Furnaces.

All three buildings are identical in structure and layout with two notable exceptions. First, Baghouse 1 is not divided internally into thirds lengthwise by two airtight, riveted steel dividers extending from floor to ceiling as are Baghouses 2 and 3. Baghouses 2 and 3 have additional doors to the left and right of the original center entryway to accommodate the additional compartments. Lastly, Baghouse 1 does not have the steel staircase/gantry that climbs the south faces of Baghouse 2 and 3.

The Baghouses are oriented NNW-SSE and are approximately 140 feet long by 50 feet wide. The roof of each has low-pitched slopes constructed of the original steel roof trusses supporting rafters underlying two layers of tongue-and-groove boards offset by half a board width. The wooden layers are covered in places with rolled asphalt roofing that is in turn covered by corrugated "galbestos," a material consisting of asbestos sprayed over galvanized steel. A steel mesh directly beneath the roof prevents some debris from falling directly to the floor. Much of the roofs have already been dismantled.

The Baghouses are separated at their bases approximately 10 feet. Each Baghouse sits on a foundation of cut stone blocks 6 feet deep. The massive brick walls are thicker at the base than the top. They are laid in an American bond variation of the running bond pattern. In this variation the number of stretcher courses varies between header courses. For example, the northeast wall of Baghouse 3 includes reinforcing rods extending through the wall to the exterior where they are capped with decorative cast iron plates in a star shape and held with square nuts. At this level the masonry includes 19 stretcher courses between single header courses.

Ten buttresses support the northeast and southwest sides with four more on the front and rear ends. The side buttresses are evenly spaced with a shallow buttress at each corner, two deep buttresses in from the corners, a shallow buttress, and then a single deep buttress. The end buttresses are shallow at each corner and deep toward the center of the wall. Each buttress is provided with additional footings that extend outward from the wall foundations. The buttresses extend upward from the footing to the top of the wall remaining at a consistent width, but reduced in depth from the wall as height increases. They are laid in horizontal courses in a combination of English common bond pattern with three stretcher courses separated by a single header course. This pattern continues to approximately half the height of a buttress at which point the pattern shifts to stretcher bond. The additional stability provided by the header courses replaced at this point by the outer corners that tie the narrower faces of a buttress together.

The buttresses and building walls are in varying states of repair or alteration. In some locations the mortar is missing near other joints where it appears to have been re-pointed. Sections of brick appear to have been replaced with new brick or concrete. This is also evident on the west façade of Baghouse 1 where large sections of brickwork appear to be replacements. Additionally, three doorways through the southwest wall have been filled with newer brick. Extending upward from the arched top of each doorway is a meandering crack sealed with Portland cement or mortar. The walls below the thresholds of the doorways appear to be replacements or were sheltered and retain a fresher appearance compared to the majority of the wall. Three buttresses along this wall have been supplemented with poured concrete enhancements. These differ from the corner buttress



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enhancements in that are of varied height and width. Those at the corner are consistent at Baghouse 1 and Baghouse 3. Baghouse 3 also has scars of infilled doorways in the outside wall, but no meandering crack is evident, and the buttresses have not been enhanced. The lower left wall panel of Baghouse 1 and also Baghouse 3 appear to be repaired with concrete poured into a form of horizontal boards. Other areas of the wall retain patches of Portland cement skins. The foundation blocks of the Baghouses have been coated with gunite.

All windows are now covered, either sealed with brick or steel. Four doors are positioned near the top of the wall on the southeast gable end of each Baghouse. The doors are arranged with a single-width door in each wall space to left and right and a pair of double-width doors centered under the gable. The doorway openings are accented with low arches of two rowlock courses. They are accessible from a wooden walkway attached to the wall and supported by steel knee braces. The northwest gable end also includes doors set high on the wall accessible from a walkway. However, the arrangement of doors on the northwest end has been impacted by the installation of the Overhead Ventilation Pipe (Feature 22) leading to the Baghouse Stack. A lower steel walkway is present on each gable end and may date to 1954 (ASARCO Drawing # 4864). This walkway provides access along the ends of the buildings at a lower level. The Baghouses are also accessible from doors off the lower walkway. The doorways off the lower walkway are in a different configuration than those above as indicated by their arrangement in the southeast wall. Here, single doors to either side are topped with low arches of two rowlock courses as above. However, the central double doors of Baghouse 2 lack the arches seen in the double doors near the gable and may have been added later. The addition of double doors at the lower level appears only in Baghouse 2 and Baghouse 3.

Each Baghouse is divided internally by brick walls with low archways. Baghouses 2 and 3 have been further divided with steel bulkheads. In the figure, the steel wall can be seen at the bottom of the frame and the masonry wall at left. ASARCO engineer drawings from 1951 denote three narrow, steel walkways installed 3 feet 6 inches below the tops of the walls, running NW-SE above the tops of the bags.

Within each Baghouse are 1260 bags, mostly canvas arrayed in 20 columns of 63 rows. Each bag measures 18 inches in diameter by 30 feet long. A metal cap affixed to the top of each bag is attached to a metal bar mounted near the tops of the walls. The bottom of the bags are installed into holes in the floor through which the blast furnace flue gasses are forced upwards. Each bar supports 20 bags in a line from SE-NW. The bars allowed the bags to shaken and the metal dust solids extracted for recovery. Plans from 1928 indicate that shaking was a manual process (ASARCO Drawing # 3575) converted after 1972 to a pneumatic process (ASARCO Drawing # 6131).

Alterations to the Baghouses in recent times include the addition of a steel landing that crosses over all three distribution flues with access stairs on the northeast and southwest corners. There are also other sets of stairs off the landing to provide ground-level access to areas between the three distribution flues. A three story gantry was added between Baghouses 2 and 3 in 1998-9.

A modern dust-handling facility was added to the northwest end of the Baghouses in the mid 1990s (ASARCO Drawings # 34-1-9598, 34-1-9599, and 41-1-9700). It leads to the Blast Furnace Baghouse Stack (Feature 35), Emission Monitoring Station (Feature 23), and Dust Handling System with Baghouse (Feature 21). An Overhead Transfer Pipe (Feature 24) conveys dust from the northeast corner of the Baghouses east to the Cottrell Electrostatic Precipitator, which has since been destroyed. The transfer pipe is supported by three steel columns 4 feet in diameter 30 feet above the paved apron. Features 21, 23, 24, and 35 are scheduled for demolition at the same time as Baghouses 1, 2, and 3.

The Acid Plant is Feature 34 at the East Helena Smelter facility. It is located in the southern angle of the facility near the 200 foot and 400 foot stacks. It was constructed in 1976 (ASARCO Drawing #03-0659-E0078). It is a large structure with associated tanks and numerous pipes and ducts mounted externally. The most noticeable characteristic is the corrugated insulation on the tanks and most of the pipe and ducts. It measures approximately 140 feet long by 100 feet with the long axis oriented NE-SW. There are several other features associated with the Acid Plant and include, the Sulfuric Acid Storage Tanks to the southwest and beyond the Monier Flue, the Overhead Acid Pipe, Acid Decolorization Building, Acid Plant Shop, Acid Plant Converter, Acid Plant Cooling Towers, Acid Plant Control Building, and 200 foot tall Acid Plant Tail Gas Stack. The Acid Plant itself is near the center of these related features. It is accessible from the surrounding paved apron. The Acid Plant was constructed to improve air emission quality by capturing sulfur compounds in flue gas and removing them from the exhaust before it was dispersed through the stacks. The captured compounds were processed as sulfuric acid and made available for sale.

An enclosed building with corrugated steel sides comprises a large part of the Acid Plant. Associated with this is a large converter tank insulated covered with insulated corrugated metal siding. Leading to and from these components of the Acid Plant are numerous pipes and ducts, some of which are also insulated with corrugated metal siding. Additionally a large blower is mounted on the west side of the group. Feature 17, the Overhead



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Acid Pipe, leads from the Acid Plant toward the Sulfuric Acid Storage Tanks to the southwest. Alterations to the Acid Plant are not discernable as distinctly different in material, design, or placement since the entire Acid Plant is of modern construction.

ASARCO Drawings are on file with the ASARCO Field Office in Helena Montana.

Cox, Blaine ASARCO East Helena Smelter Maintenance Manager, personal communication September 8, 2008.

3.6 Artifacts: (✓ all that apply) ☐ Chipped Stone ☐ Wood ☐ Ground Stone ☐ Ceramics ☐ Bone ☐ Trade ☒ Other  
Description:

3.7 Diagnostic Artifacts: N/A

3.8 Subsurface Testing: N/A

3.9 Site function/interpretation: Historic Lead Smelter Facility

### 4. PERIOD

4.1 Apparent Time Period of Site (use dropdowns):

Prehistoric

Historic Historic More Than One Decade

Paleontological

### 5. ENVIRONMENTAL SETTING

5.1 Geographic Setting: The East Helena Smelter is located in southeast Helena Valley. This section of Helena Valley is composed of interbedded Tertiary, Quarternary, and Pleistocene bedrock, with the later as the parent material at the location of the smelter. The valley contains a number of creeks and lakes that flow roughly northeast and drain into the Missouri River. Prickly Pear Creek, a southeast to northwest flowing system that runs through East Helena, is the primary drainage for runoff from the East Helena Smelter, and is situated less than a half mile east of the smelter. Prickly Pear Creek drains into Tenmile Creek approximately six miles north northeast of East Helena. Tenmile Creek flows northeast to Helena Lake, which in turn drains into the Missouri River only 10 miles northeast of East Helena.

5.2 Contour: ☒ Known ☐ Approximate ☐ Unknown

5.3 Elevation: 3920

5.4 View/Aspect (estimated direction and distance):

5.5 Sediments: In areas that have not been disturbed by smelter activities, sediments consist primarily of fine silt and gravelly sand alluvial loams. Sediments in the general project area belong to the Sappington-Amesha, Fluvaquents and Fluvaquentic Haplustolls, and Meadowcreek-Fairway complex soil associations. The Sappington-Amesha sediments consist of coarse loamy alluvium and gravelly colluvium found across the hillsides, plains, and knolls, and within intact alluvial fans (NRCS <http://websoilsurvey.nrcs.usda.gov>). The Fluvaquents and Fluvaquentic Haplustolls sediments consist of decomposed plant materials over silt loam alluvium and very gravelly alluvium found in the drainage ways and across the flood plains (NRCS <http://websoilsurvey.nrcs.usda.gov>). The Meadowcreek-Fairway complex sediments consist of fine silt loam alluvium over sandy and gravelly alluvium found throughout the flood-plain steps, drainage ways, terraces, and flood plains (NRCS <http://websoilsurvey.nrcs.usda.gov>).

Deposition: ☐ Surface Only ☐ Buried Only ☐ Surface and Buried ☐ Redeposited ☒ Other

5.6 Available Water Sources (use dropdown): Stream/River/Creek

5.7 Major River Drainage (name, distance, elevation): Prickly Pear Cr 0.25 mi. 3900

5.8 Minor Drainage (name, distance, elevation):

5.9 Local Vegetation:

Regional Vegetation:



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### **6. ASSESSMENT, RECORDING & MANAGEMENT**

**6.1 Significance:** Under Criterion A, a commercial property must be shown to have been significant in commercial history, which in this case, the East Helena Smelter was important because it was crucial to the town's economic stability and growth and as a commercial focus in the Helena Valley, as well as embodies the importance of innovation within the smelting industry.

**6.2 Condition/Integrity:** Integrity has been negatively impacted by the improvement, upgrading, and remodeling of original buildings with modern materials and the altering of floor plans and designs by the addition of modern buildings, and the East Helena Smelter contains few of its original distinctive elements.

**6.3 Possible impacts to site:** In keeping with Phase 1 of this project (Summer/Fall 2008), the four primary structures listed above have been cleaned and demolished.

**6.4 Evaluation:** Does this property meet National Register criteria for eligibility? ☒ Yes ☐ No ☐ Unevaluated

**Evaluation Procedures/Justification:** National Register eligibility for any property, including Historic Period archeological sites, depends on integrity and significance. The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association. Historic integrity simply refers to a property's authenticity. Not all seven elements of integrity are required for National Register eligibility, but sufficient integrity must remain so that the property still conveys its significance. Ordinarily, reconstructed historic buildings and properties that have achieved significance within the last 50 years shall not be considered for the National Register. Also, just because a building is in poor condition does not mean it has lost its historic integrity (required for National Register eligibility). Vacant and deteriorating buildings are often nominated to the National Register because the designation can stimulate interest in developing them for a modern use. In this case, the East Helena Smelter is going to be completely cleaned and demolished therefore nomination to the National Register for revitalization of the Helena commercial district is not possible. Properties can be eligible for the National Register, under Criterion C, if they embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction. Integrity for a Historic Period archeological site is typically based on the presence of features and whether or not they can tell us something about the location. The East Helena Smelter does not meet the criteria to qualify as an integral part of a district since it is not a religious property or cemetery, nor are any of the features a surviving structure associated with a historic person or event. The East Helena Smelter is not the birthplace or grave of a historical figure of outstanding importance, nor have any of the features been reconstructed in a suitable environment and presented in a dignified manner as a part of a restoration master plan. Unfortunately the East Helena Smelter does not retain many distinctive elements of original workmanship, design, and materials that would give the many buildings associated with this property stylistic integrity since all of the features recorded at this location have been improved, upgraded, or remodeled with modern materials or are modern structures. The occurrence of modern improvements and modern structures has altered the general form, floor plan, and materials, of all 39 features ARCADIS recorded during this undertaking and has adversely affected the integrity of association and feeling.

Lack of integrity alone, however, does not automatically exclude this site as eligible for the National Register.

Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of history. To be considered for listing under Criterion A, a property must be associated with one or more events important within the defined historic context. Significance of the East Helena Smelter was evaluated on the basis of literature searches, historic aerial photographs, USGS topographic maps, and ASARCO engineer drawings. Construction of the East Helena Smelter began in the summer of 1888 and was in full production by 1891. The original plant included six roasters, four blast furnaces, one copper matte smelting furnace, and three stacks (Stallings 2004). Over the years, new technologies and new types of processing equipment were added to the East Helena Smelter such as the addition of electric trolleys in the 1920s and the installation of new equipment to keep pace with changes in regulation and address concern for environmental pollutants. Under Criterion A, a commercial property must be shown to have been significant in commercial history, which in this case, the East Helena Smelter was important because it was crucial to the town's economic stability and growth and as a commercial focus in the Helena Valley, as well as embodies the importance of innovation within the smelting industry.

The smelter and community of East Helena experienced consistent, although measured growth and a sense of



## MONTANA CULTURAL RESOURCES INFORMATION SYSTEM (CRIS) FORM

stability perhaps fostered by consistent production at the smelter that seemed to reflect the community as well. Like other communities at the time, social events involved members of the community, often with the support of the town's primary employer. The smelter was a major factor in the prosperity and security of East Helena. The East Helena Smelter may be commemorative in intent based on its age, tradition, or symbolic value as a location that reflects the disciplines of work and values of people employed at the Smelter as well as reveal priorities and goals of the American public locally and nationally. Economic conditions in the area reflected those of the wider region and the nation.

**Stallings, Manley K. 2004. The East Helena Smelter. In Prickly Pear Junction, East Helena's Heritage..**

**6.5 Recording status:** ☒ surface examination ☒ photo ☒ map ☐ subsurface tested

**6.6 Recommendations (use dropdown):** No Further Work

**Comments:**

**6.7 Site Located by:** N/A

**Date Located:**

**6.8 Site Recorded by:** ARCADIS

**Date Recorded:** August 2008

**6.9 Site form update and revisions by:**

**Date updated:**

**6.10 Federal/State Permit No:**

**6.11 Publication(s)/Report(s) where site is described:** ASARCO East Helena Smelter, Historic Recordation, Lewis and Clark County, Montana. Prepared by ARCADIS US, Inc.

**6.12 Artifact Repository:**

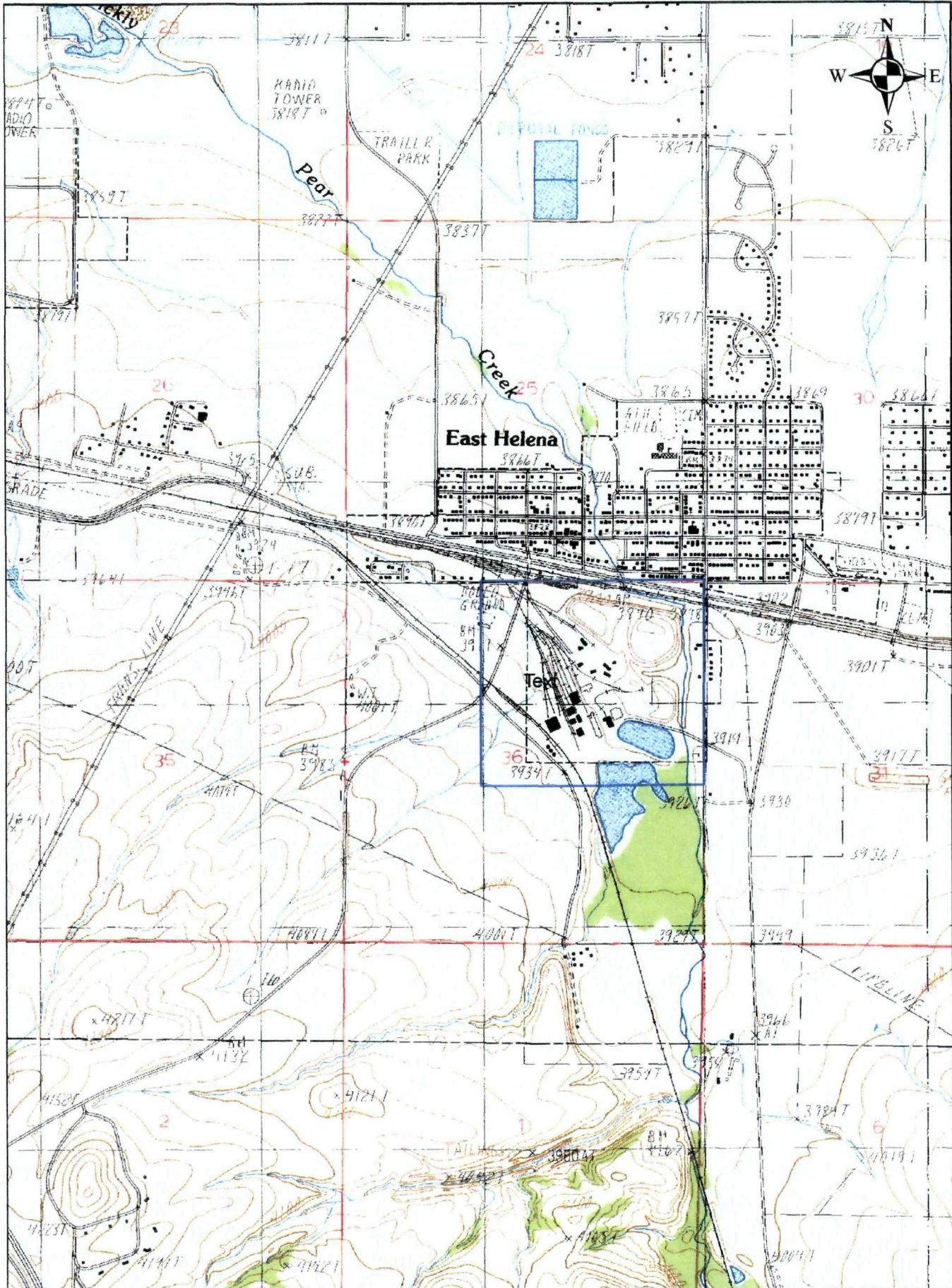
**6.13 Field notes/maps/photos repository:**

**6.14 Photographs:** Yes

**\*6.15 Map:** Attach a sketch map (if applicable) and photocopy of 7.5' Quad showing site location.

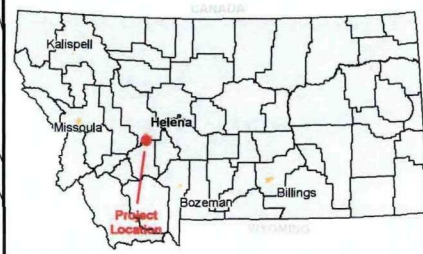
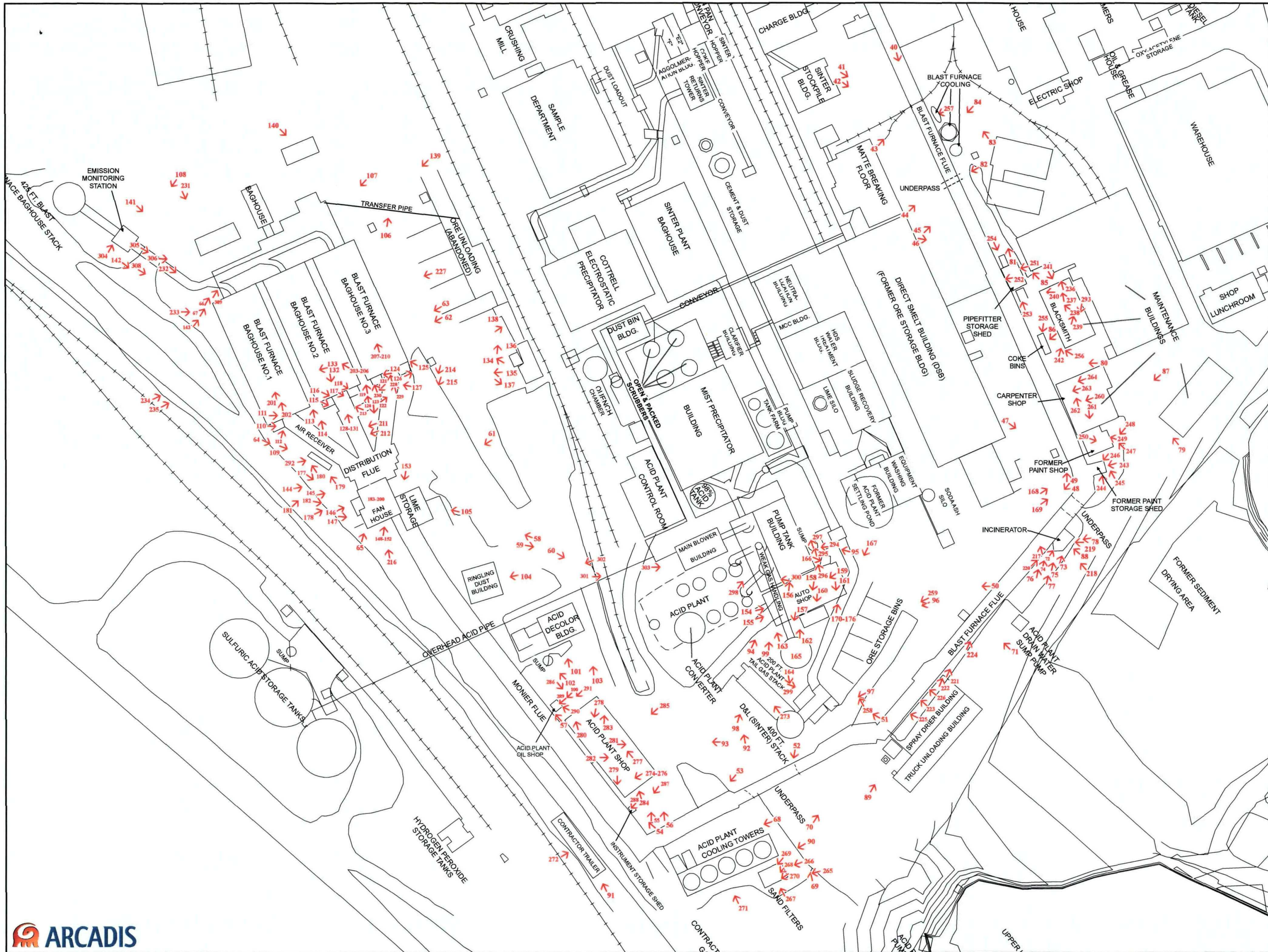


R3W



T10N

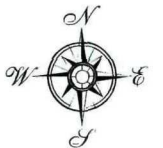




Project Area: Lewis & Clark  
County, Montana  
T. 10 N., R. 3 W., Section 32

### Legend

↑ Photo Number, Location,  
and Direction



50 25 0 50 100  
Feet

ASARCO

Attachment A  
Demolition Foot Print  
Photograph Locations

ANALYSIS AREA: Lewis & Clark County, Montana  
Date: 9/11/2008 File: Demolition\ProjectArea.mxd  
Prepared By: JG Layout: ProjectArea.pdf



Figure C.31.1

**Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #40. Viewed from Blast Furnace demo site toward the flue. Arched brickwork is visible above the boarded-over flue cavity.**



Figure C.31.2

**Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing east southeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #41. Construction and attachments at end of flue.**





Figure C.31.3

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #42. Overview of the extent of the flue.



Figure C.31.4

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #43. Railroad underpass beneath the flue.





Figure C.31.5

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #44. Vehicle/pedestrian underpass and connecting pipe.

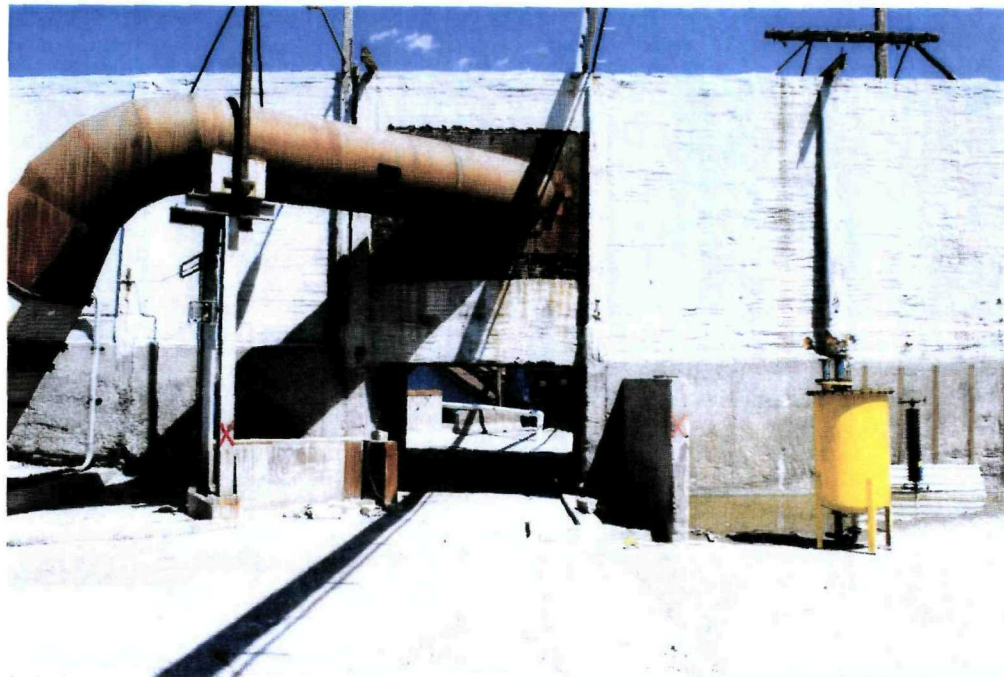


Figure C.31.6

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #45. Steel columns buttressing the flue masonry.





Figure C.31.7

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #46. View of timber columns buttressing the flue masonry.

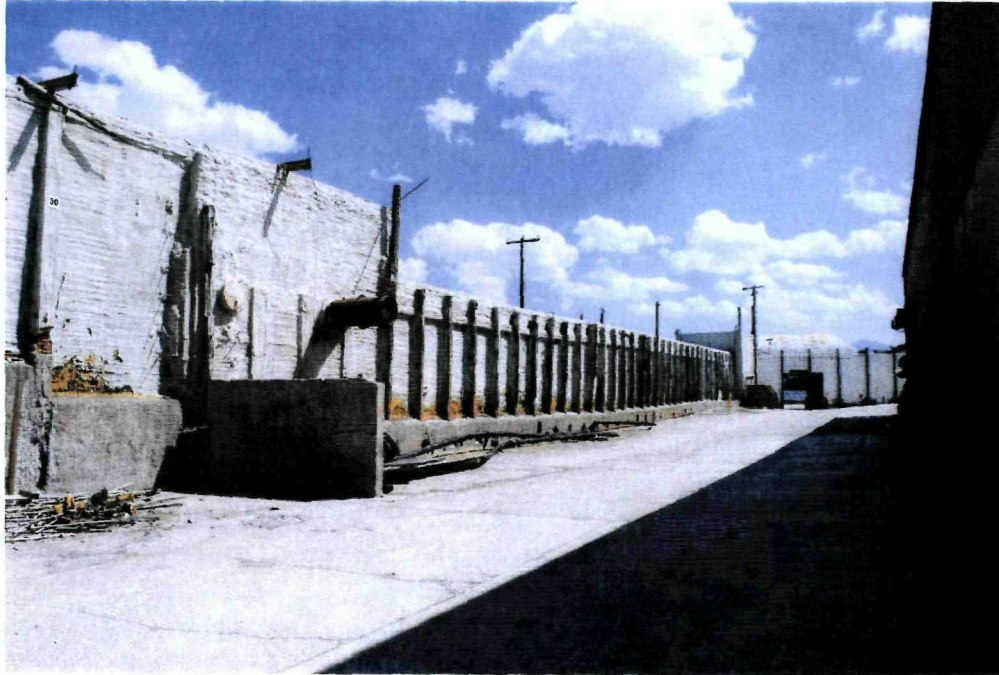


Figure C.31.8

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #47. Underpass beneath the flue, angle point, and buttressing.





Figure C.31.9

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana,  
facing southwest. Photograph taken by Brent Slensker, July 29, 2008.  
Photograph #48. View shows proximity of flue to Stacks and Acid Plant (r).



Figure C.31.10

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana,  
facing north northeast. Photograph taken by Brent Slensker, July 29, 2008.  
Photograph #49.





Figure C.31.11

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing south. Photograph taken by Brent Slensker, July 29, 2008. Photograph #52. Upward view of underside of flue at large vehicle underpass.



Figure C.31.12

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing east southwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #53. Intersect with Monier Flue.





Figure C.31.13

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing south southeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #60. Proximity of large vehicle underpass to Acid Plant.

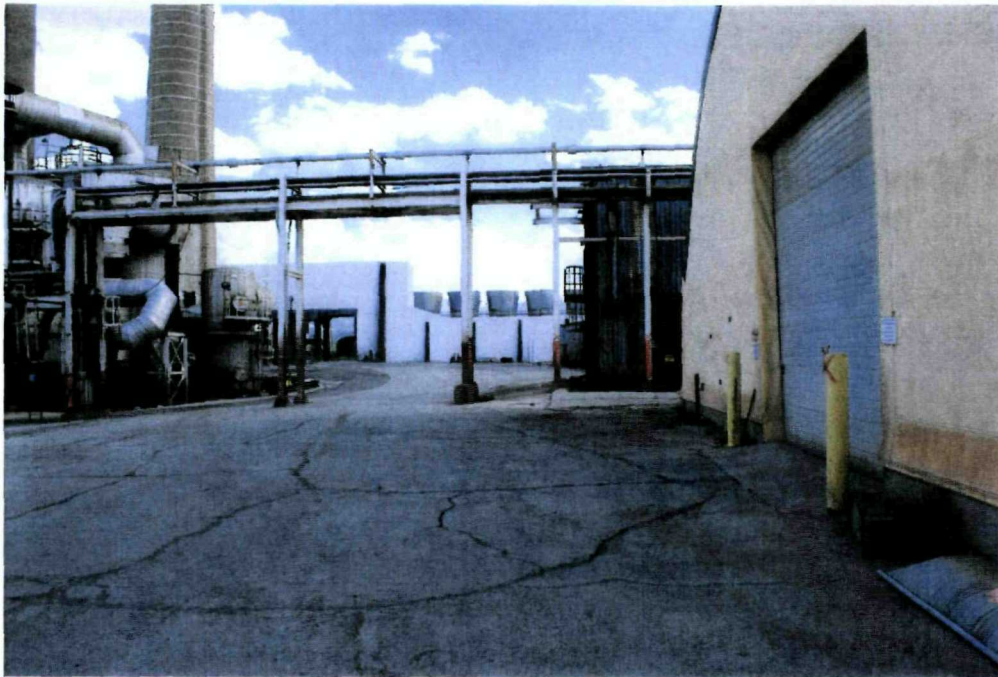


Figure C.31.14

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, July 29, 2008. Photograph #68. Flue buttresses and vehicle underpass near Monier Flue intersection.





Figure C.31.15

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #69. Multi-path underpass near stacks looking toward acid plant.

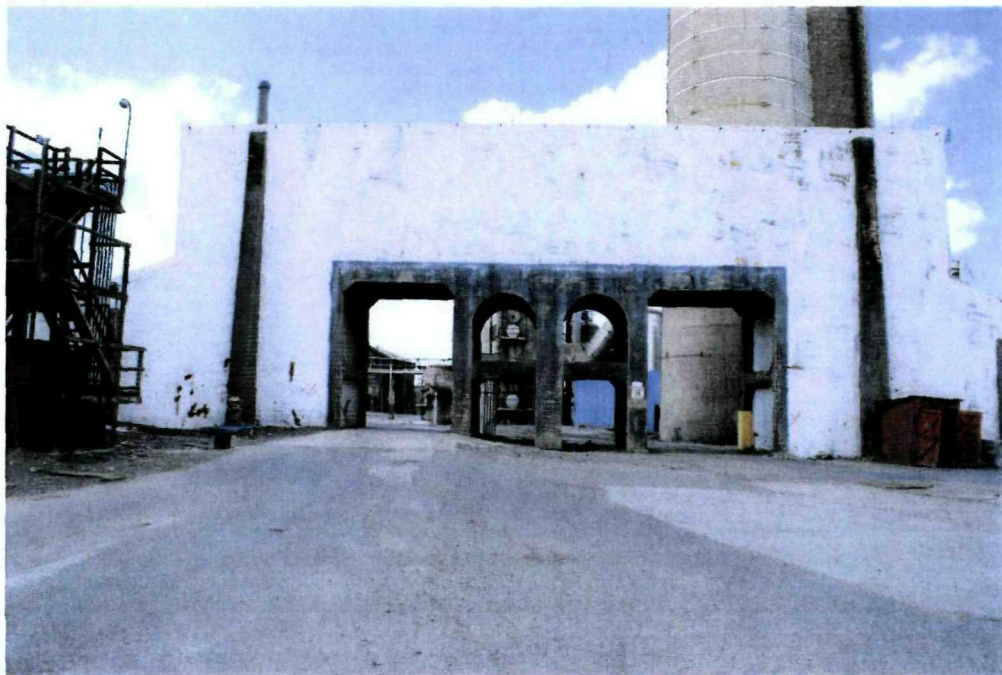


Figure C.31.16

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, July 29, 2008. Photograph #70. Sealed flue section near an angle point.





Figure C.31.17

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #71. Flue exterior showing abandoned access.



Figure C.31.18

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing southwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #80.

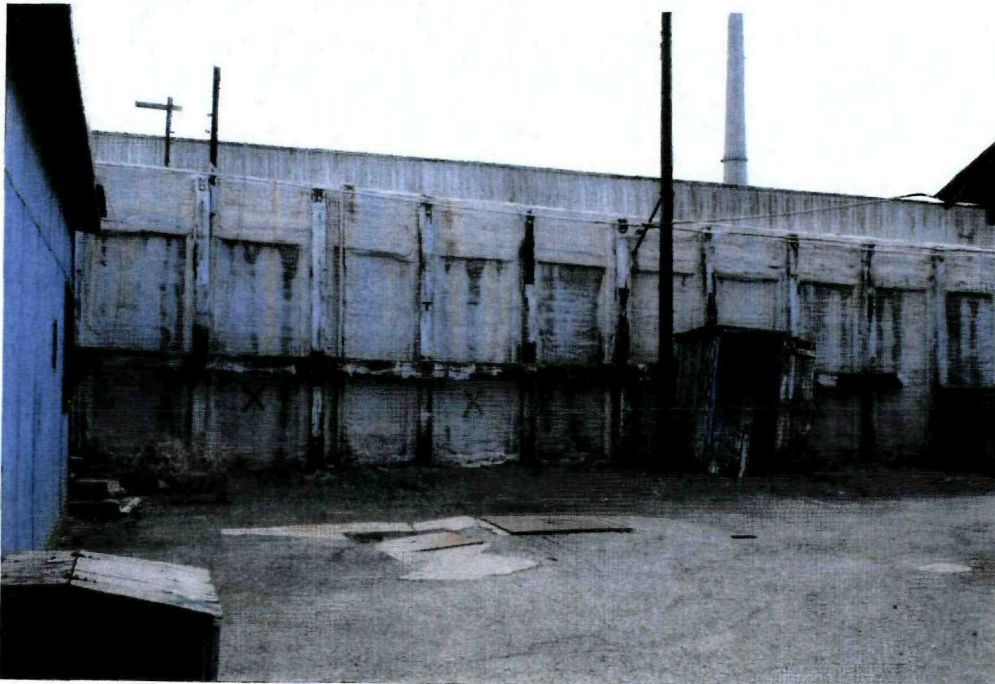




Figure C.31.21

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #83. View of underpasses at the current northern terminus.



Figure C.31.22

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, July 30, 2008. Photograph #84. View of underpasses at current northern end near Cooling Water Tanks.





Figure C.31.23

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #168. Bin adjacent to the flue.



Figure C.31.24

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #169. Closer view of bin at flue showing construction and staining.





Figure C.31.25

Blast Furnace Flue interior, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #217. Looking into the flue at the Incinerator.

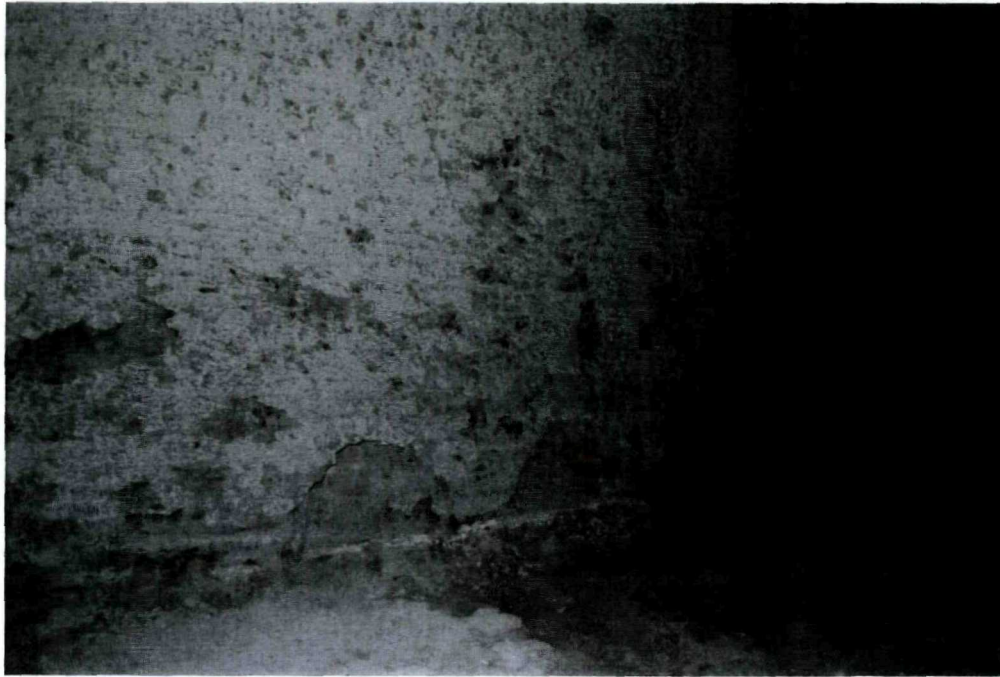




Figure C.31.26

Blast Furnace Flue roof, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, August 7, 2008. Photograph #221. Viewed from the Spray Dryer Building gantry.





Figure C.31.27

Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana,  
facing northeast. Photograph taken by Brent Slensker, August 7, 2008.  
Photograph #222. Flue roof showing piping, access, and buttressing.





**Figure C.31.28**

**Blast Furnace Flue, East Helena Smelter, Lewis and Clark County, Montana, facing east. Photograph taken by Brent Slensker, August 8, 2008. Photograph #272. West end of Blast Furnace Flue at Monier Flue.**

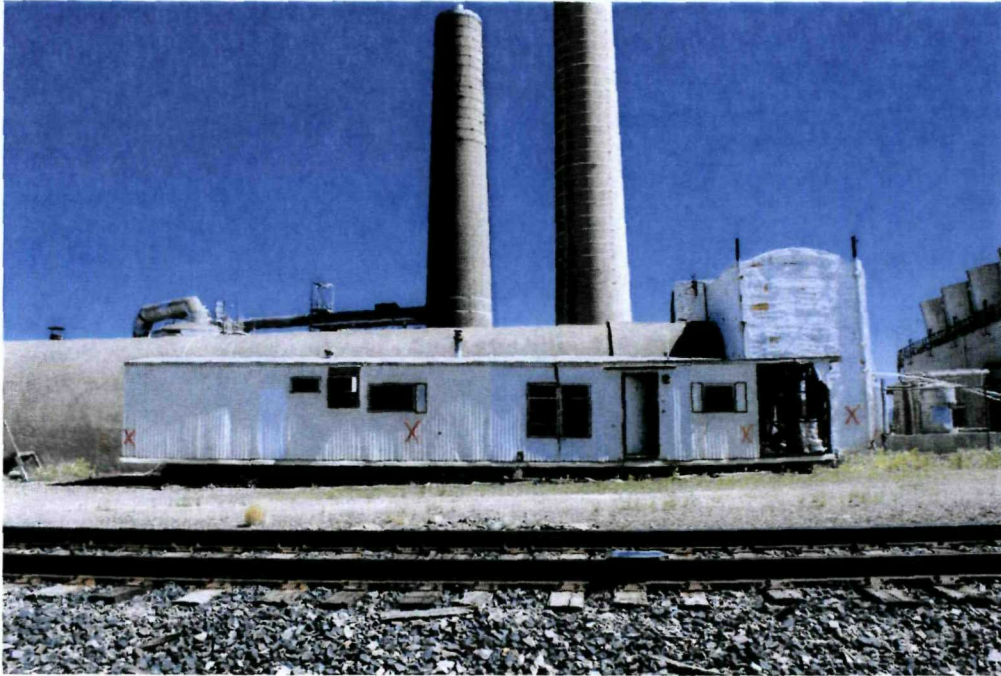
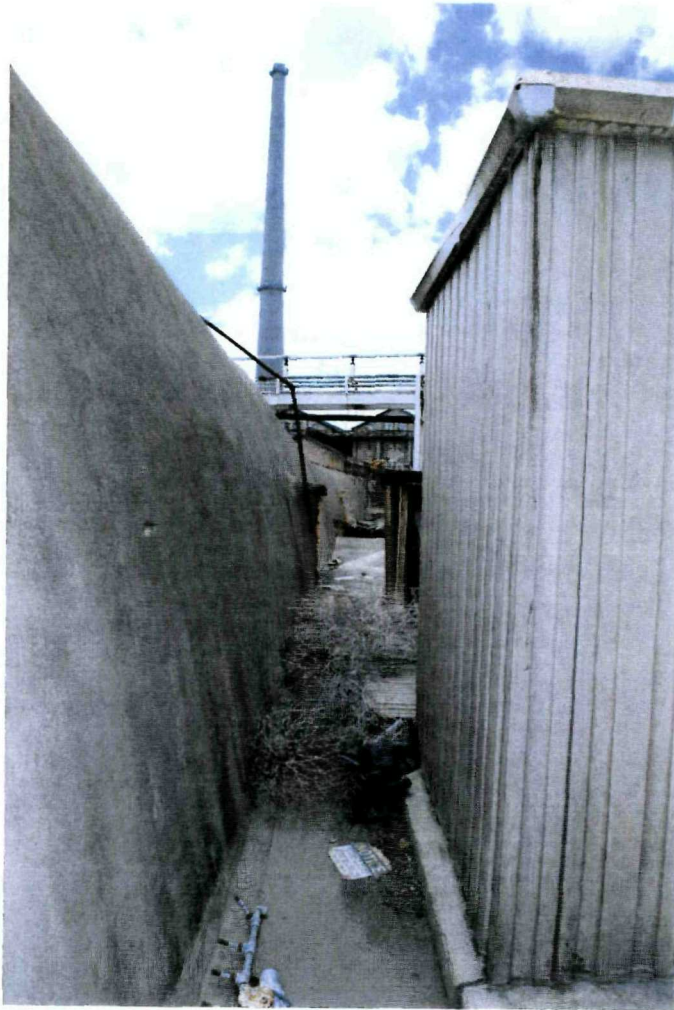




Figure C.33.1

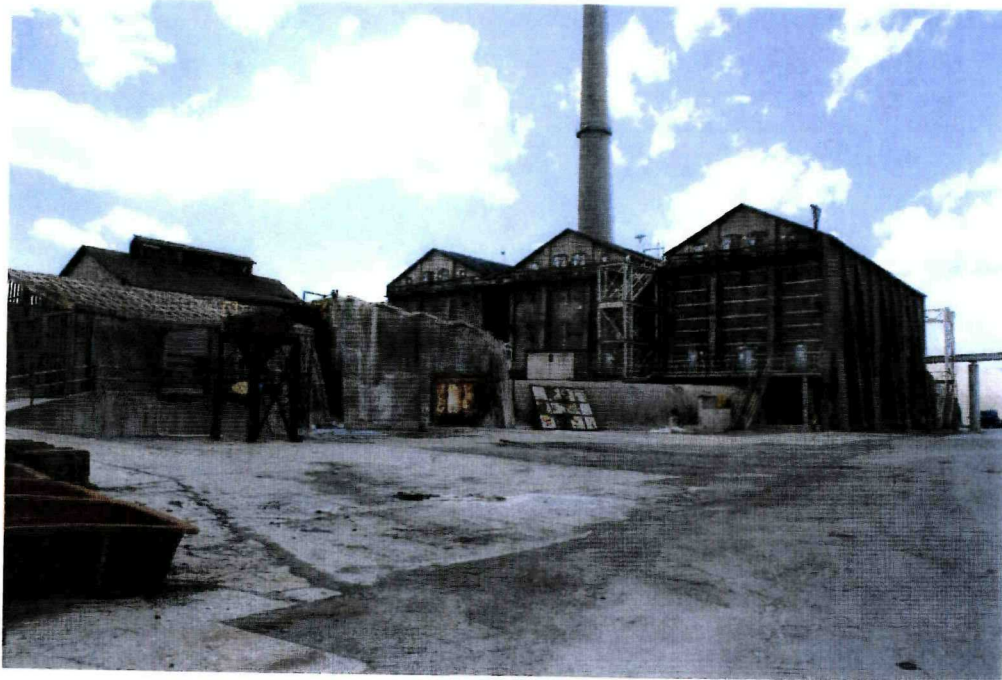
**Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #57. View is along the Monier Flue toward the Baghouses at center.**





**Figure C.33.2**

**Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #58. Fan House at left, Distribution Flue and Baghouses.**



**Figure C.33.3**

**Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing southwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #62. Detail of masonry repair and stabilization.**





**Figure C.33.4**  
Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing southwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #63. Detail of masonry repair and stabilization.



**Figure C.33.5**  
Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #110. Distribution Flues entering Baghouses (l) from Fan House (r).





Figure C.33.6

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing east. Photograph taken by Brent Slensker, July 30, 2008. Photograph #111. Steel Baghouse walkway and Baghouse Office/Control Room.



Figure C.33.7

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing northeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #112. Looking up to wooden walkway from steel walk.

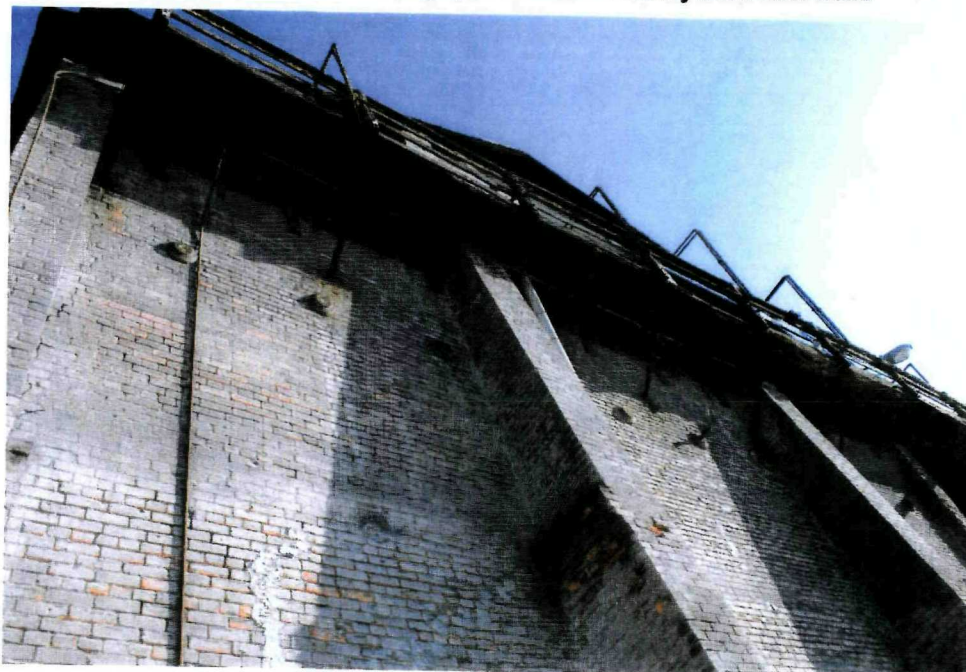




Figure C.33.8

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #113. View between Baghouses 1 and 2 from suspended walkway between the Baghouses showing the relationship between Baghouses, upper.





Figure C.33.9

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #114. View between Baghouses 1 and 2 from suspended walkway between the Baghouses showing the relationship between Baghouses, lower.

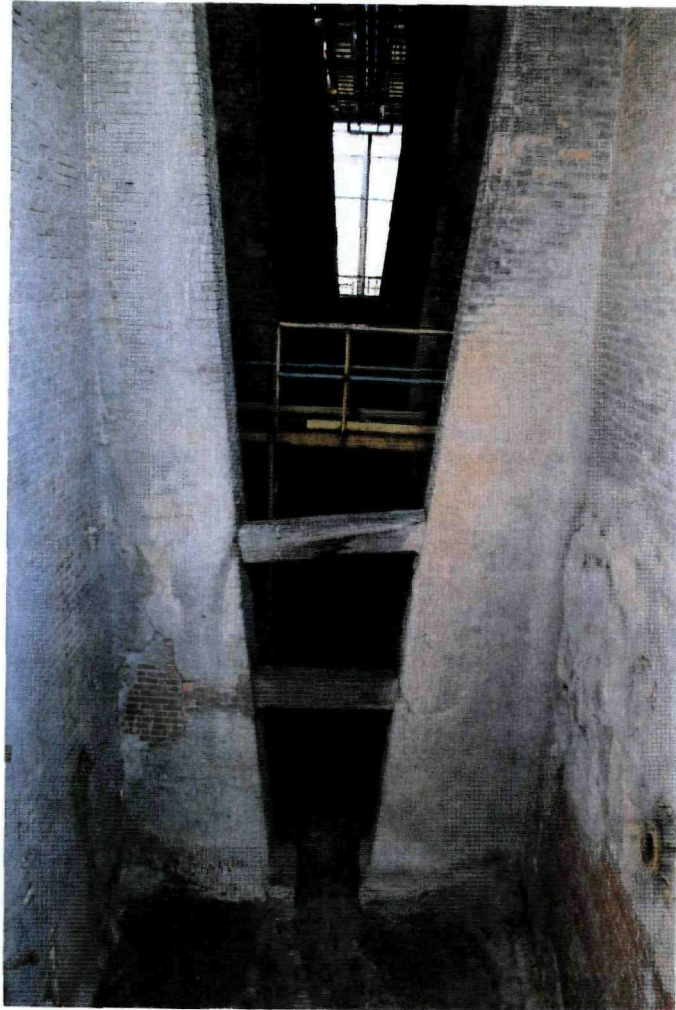




Figure C.33.10

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #119. View between Baghouses 2 and 3 from suspended walkway between the Baghouses showing the relationship between Baghouses, lower.





Figure C.33.11

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #120. View between Baghouses 2 and 3 from suspended walkway between the Baghouses showing the relationship between Baghouses, upper.



Figure C.33.12

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing southwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #121. View from Baghouse 2.





Figure C.33.13

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing south southeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #124. Wooden walkway on Baghouses.





Figure C.33.14

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #125. Roof of Baghouse 2.



Figure C.33.15

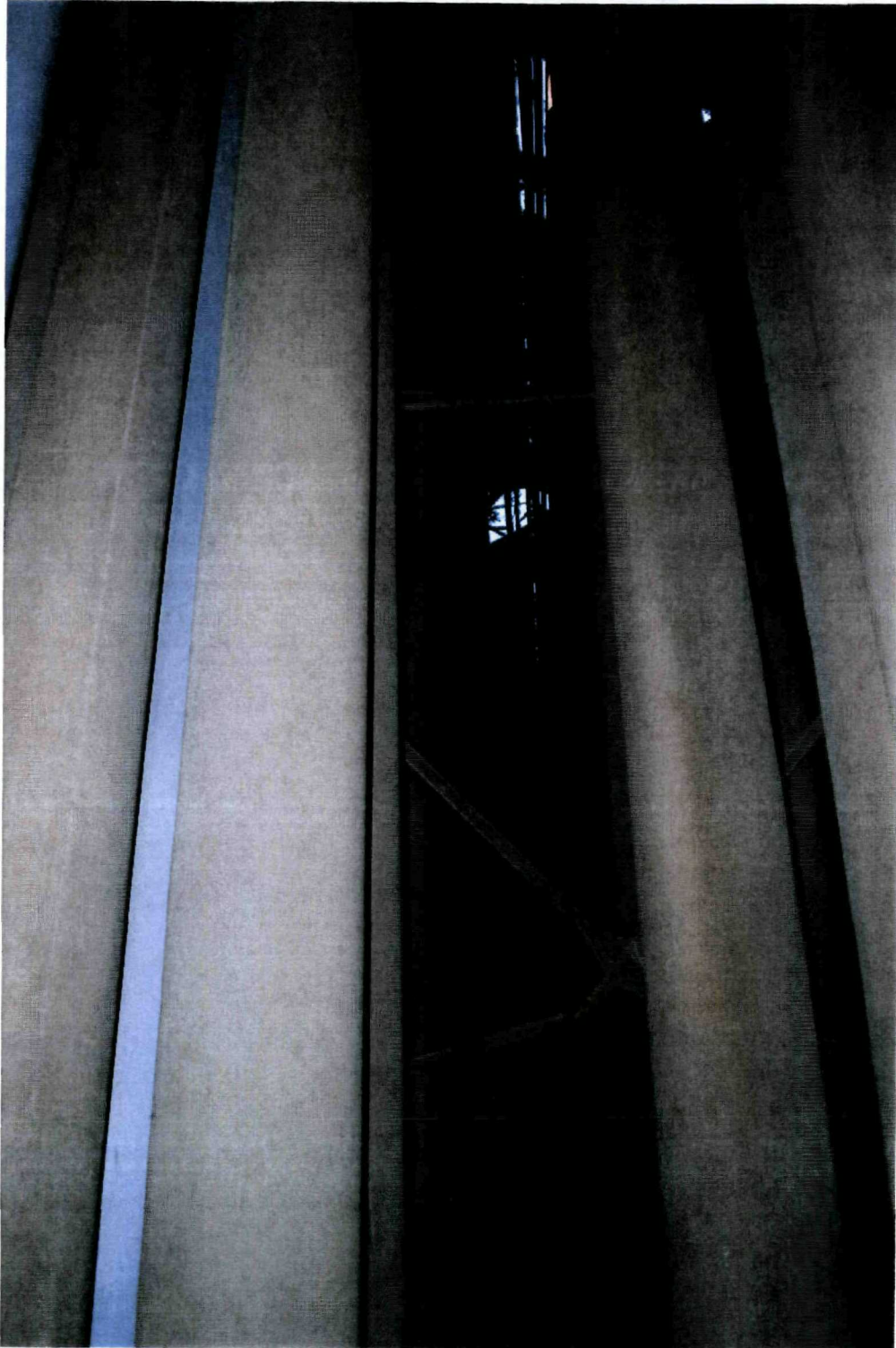
Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, July 30, 2008. Photograph #127. Baghouses 1 and 2 south end.





Figure C.33.16

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #128. Bags suspended inside Baghouse 2.





**Figure C.33.17**

**Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #129. Suspended bags inside Baghouse 2.**

**Figure C.33.18**

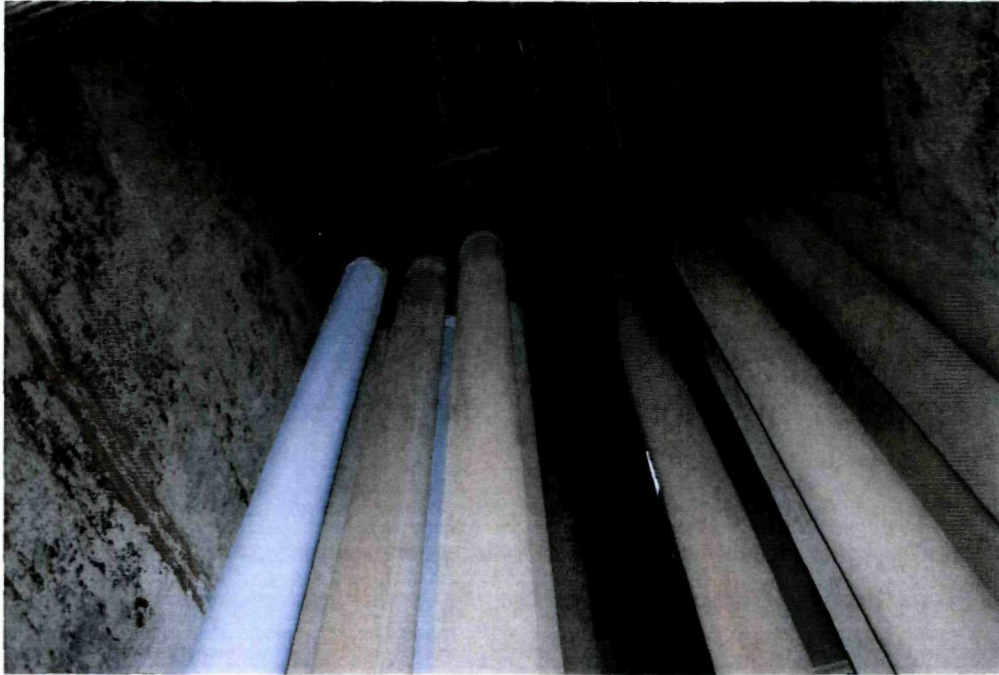
**Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #130. Suspended bags inside Baghouse 2.**





**Figure C.33.19**

**Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #131. Suspended bags inside Baghouse 2.**



**Figure C.33.20**

**Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #132. South wall inside Baghouse 2.**





Figure C.33.21

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing southwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #133. Suspended bags at west wall inside Baghouse 2.



Figure C.33.22

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing west northwest. Photograph taken by Brent Slensker, July 30, 2008. Photograph #134.

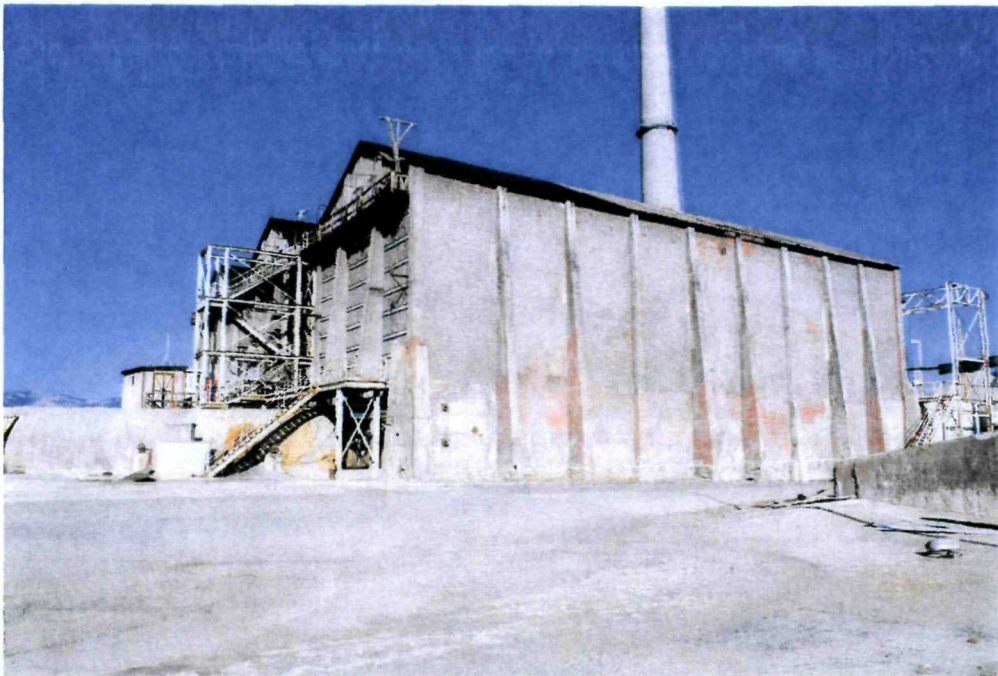




Figure C.33.23

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing south. Photograph taken by Brent Slensker, July 30, 2008. Photograph #140. North end of Baghouse 3.





Figure C.33.24

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing south. Photograph taken by Brent Slensker, July 30, 2008. Photograph #141. North end of Baghouses 1 and 2.



Figure C.33.25

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing east southeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #142. Baghouse 1.





Figure C.33.26

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 5, 2008. Photograph #180. Upper portion of Baghouse 1 south end.

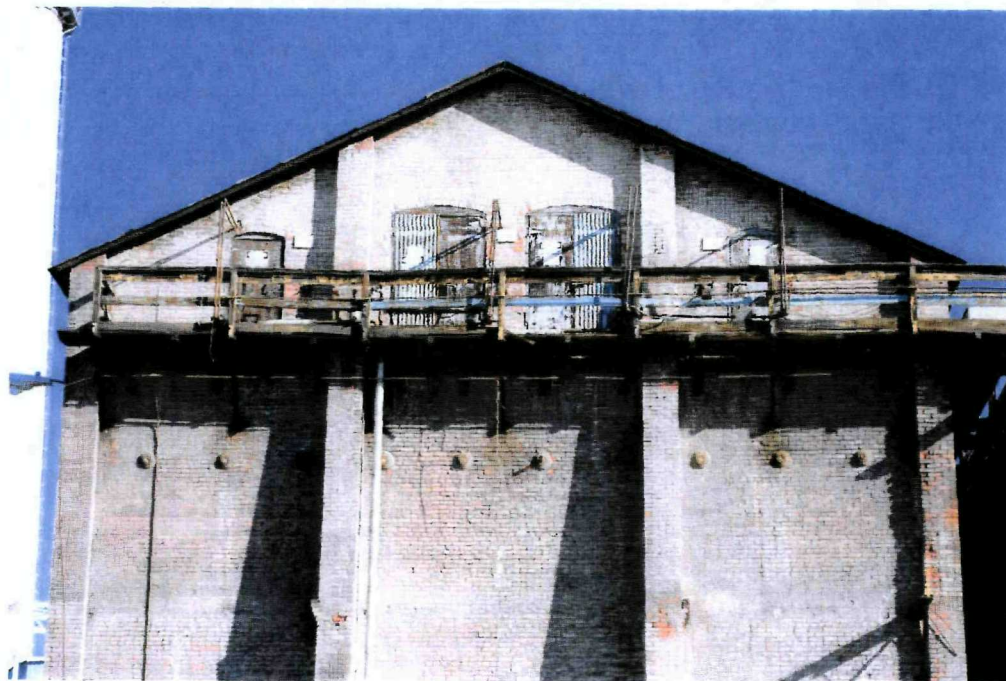




Figure C.33.27

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #201. Inside Baghouse 1 at door 1.





Figure C.33.28

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #202. View of masonry arch between bags in Baghouse 1.

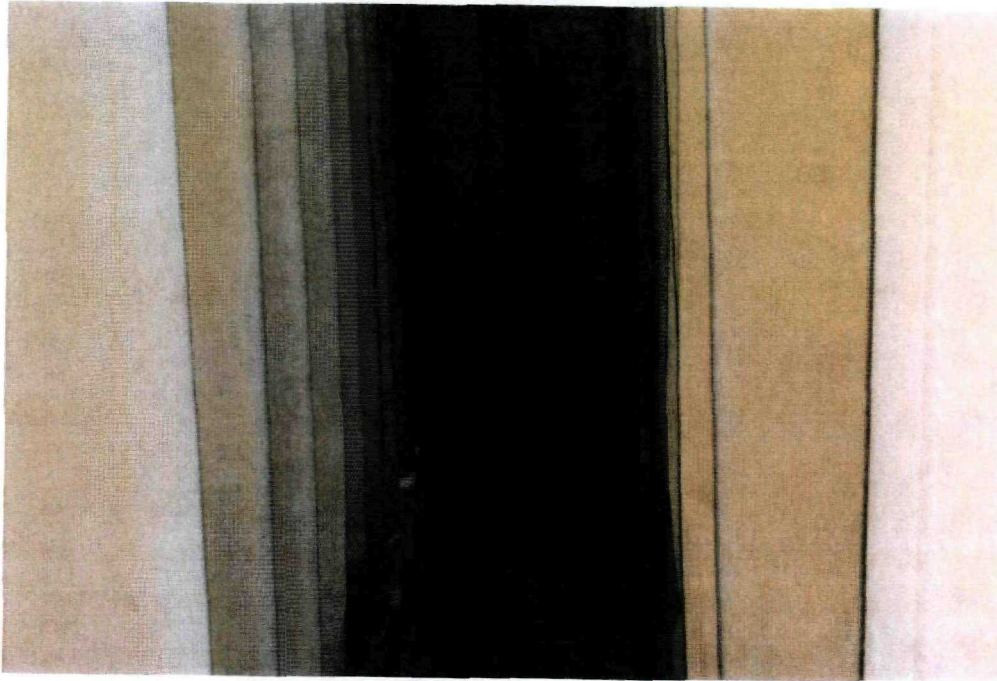


Figure C.33.29

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, August 6, 2008. Photograph #203. Bag hanging rods.





Figure C.33.30

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, August 6, 2008. Photograph #204.



Figure C.33.31

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #205. Bag hanging rods.





Figure C.33.32

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #206. Suspended bags.





Figure C.33.33

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #207. Suspended bags and access walkway.





**Figure C.33.34**

**Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #208. Suspended bags.**

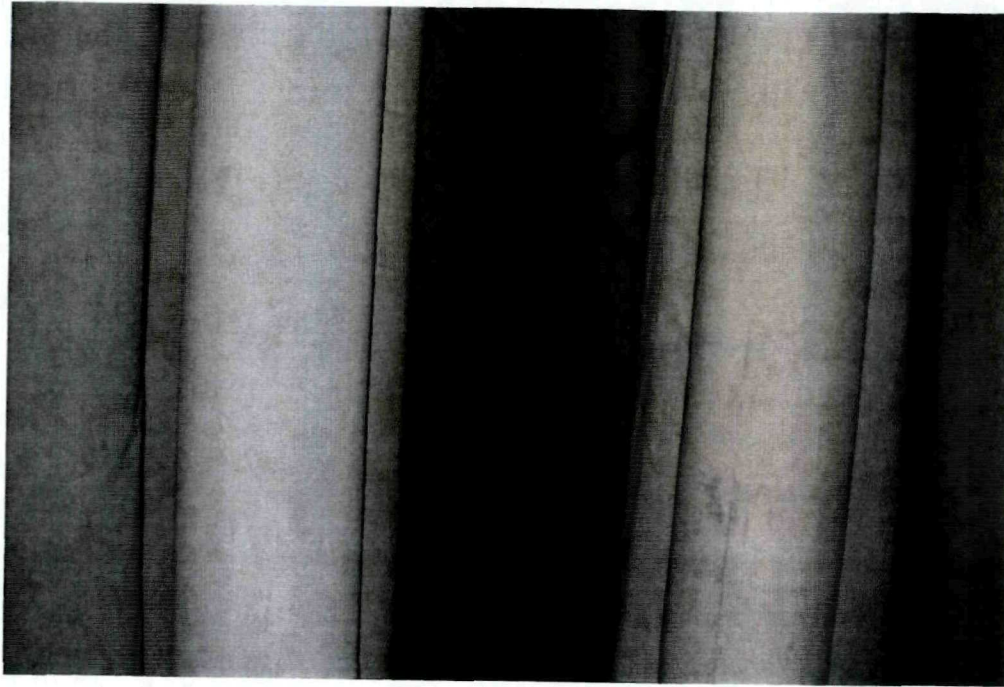




Figure C.33.35

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #209. Suspended bags.





Figure C.33.36

Blast Furnace Baghouses interiors, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 6, 2008. Photograph #210. Suspended bags.

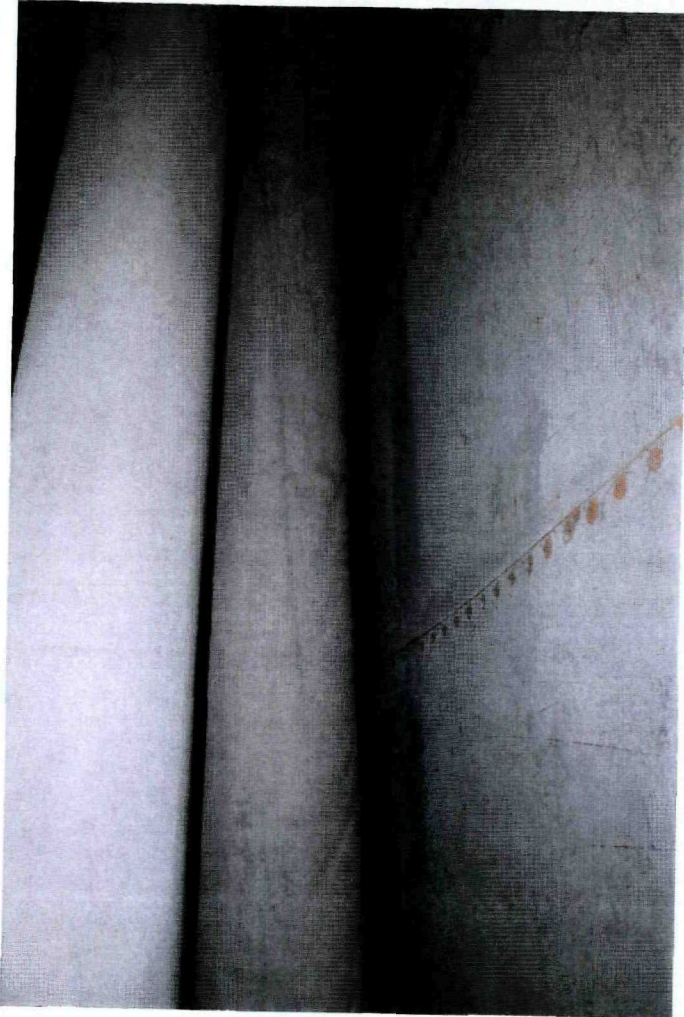




Figure C.33 37

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, August 6, 2008. Photograph #211. Distribution Flue into Baghouse 2.



Figure C.33.38

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, August 6, 2008. Photograph #212. Distribution Flue into Baghouse 2.

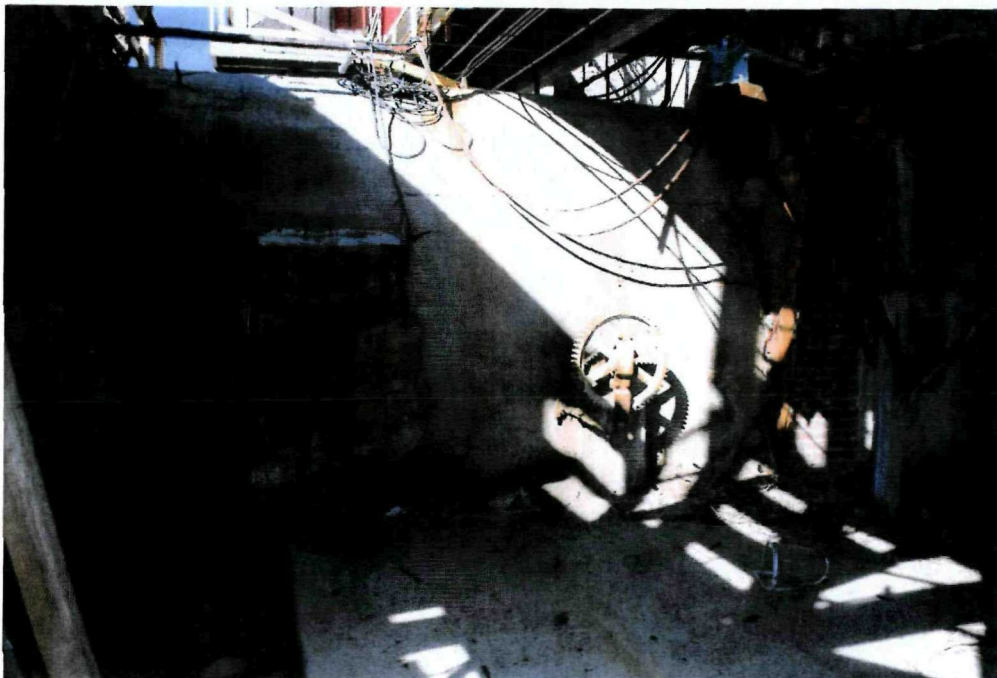




Figure C.33.39

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, August 6, 2008. Photograph #213. Steel and wooden walkways at southeast Baghouse ends.

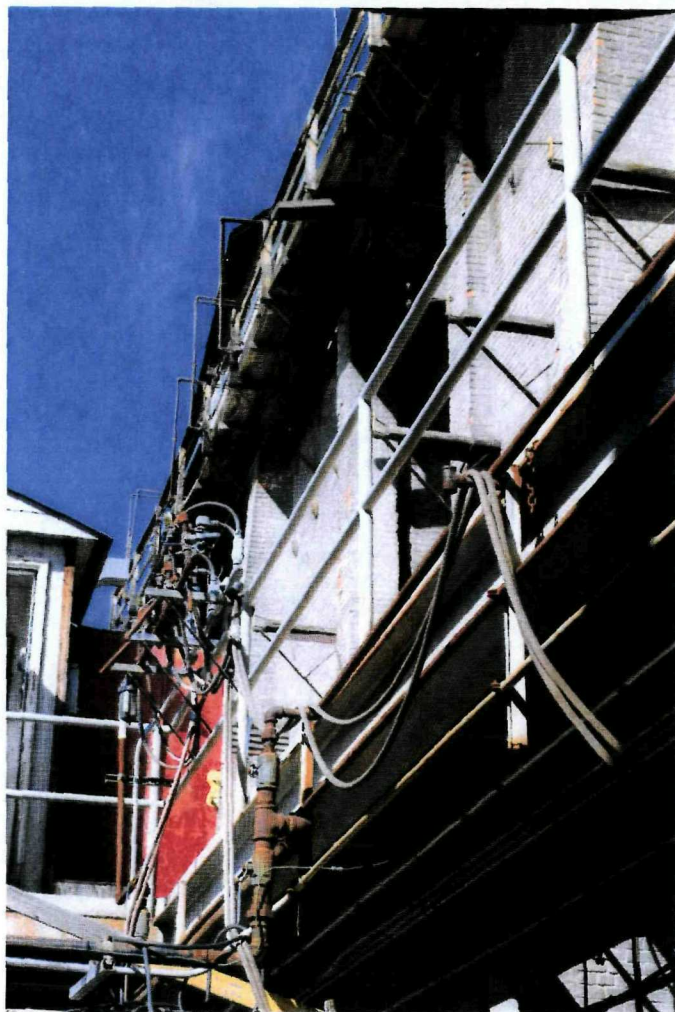




Figure C.33.40

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing south. Photograph taken by Brent Slensker, August 6, 2008. Photograph #214. Bag caps on gantry.



Figure C.33.41

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing south. Photograph taken by Brent Slensker, August 6, 2008. Photograph #215. Bag caps on gantry.

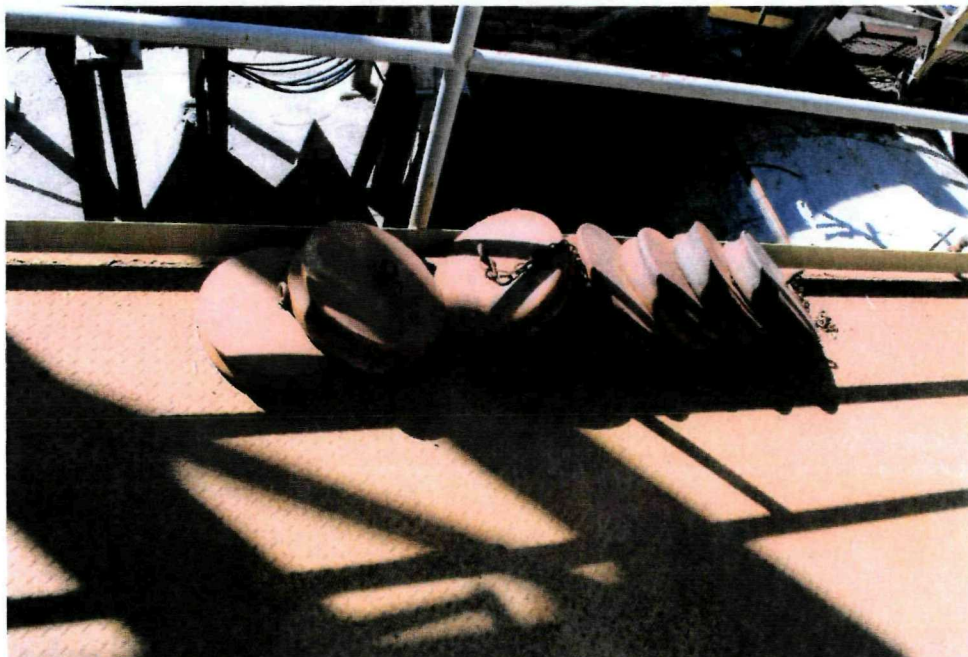




Figure C.33.42

**Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, August 7, 2008. Photograph #227. Baghouse 3, east side.**





Figure C.33.43

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Siensker, August 7, 2008. Photograph #228. Cut-in door to Baghouse 2, south end.

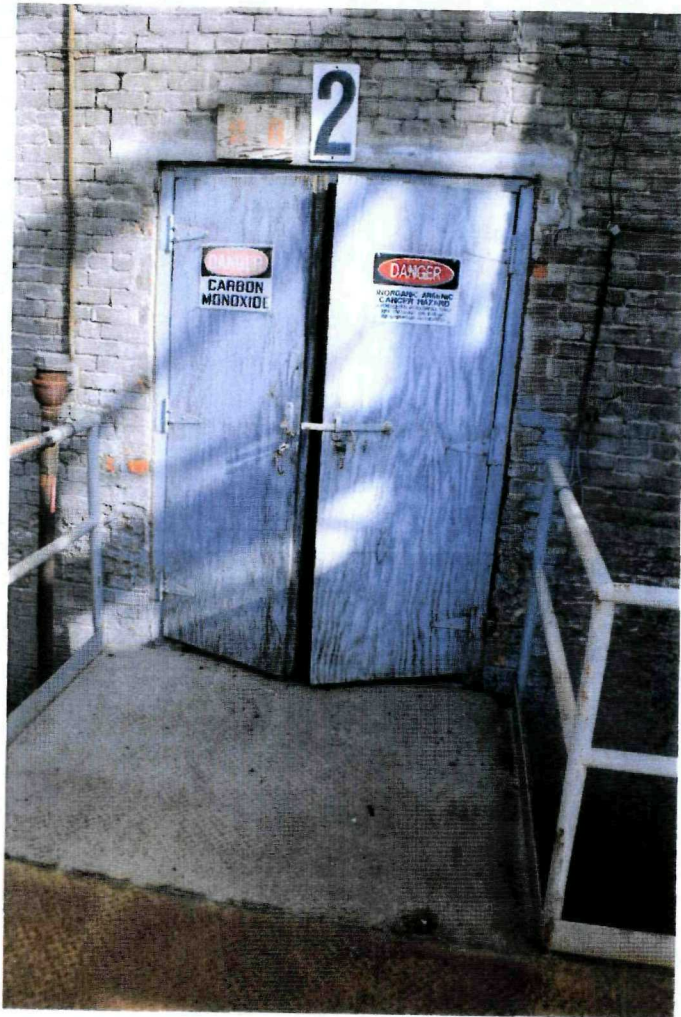




Figure C.33.44

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, August 7, 2008. Photograph #229. Baghouse 3, single doorway as originally constructed.

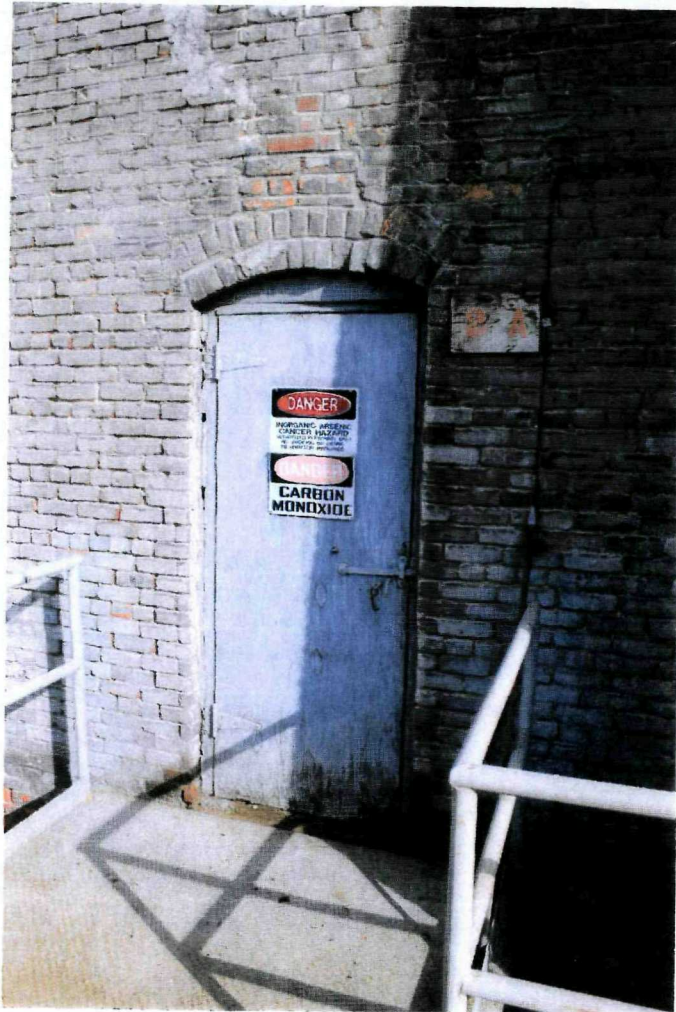




Figure C.33.45

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, August 7, 2008. Photograph #230. Bag cap details.



Figure C.33.46

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing northwest. Photograph taken by Brent Slensker, August 7, 2008. Photograph #231. South end of Baghouses.

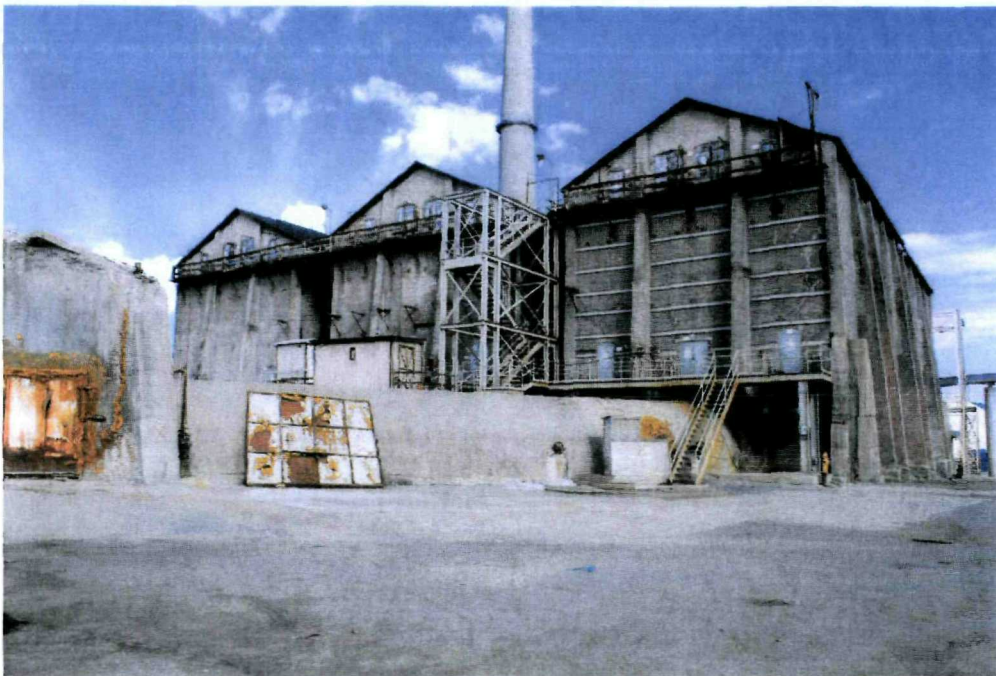




Figure C.33.47

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, August 7, 2008. Photograph #232.



Figure C.33.48

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing east. Photograph taken by Brent Slensker, August 7, 2008. Photograph #233.





Figure C.33.49

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing east. Photograph taken by Brent Slensker, August 7, 2008. Photograph #234.

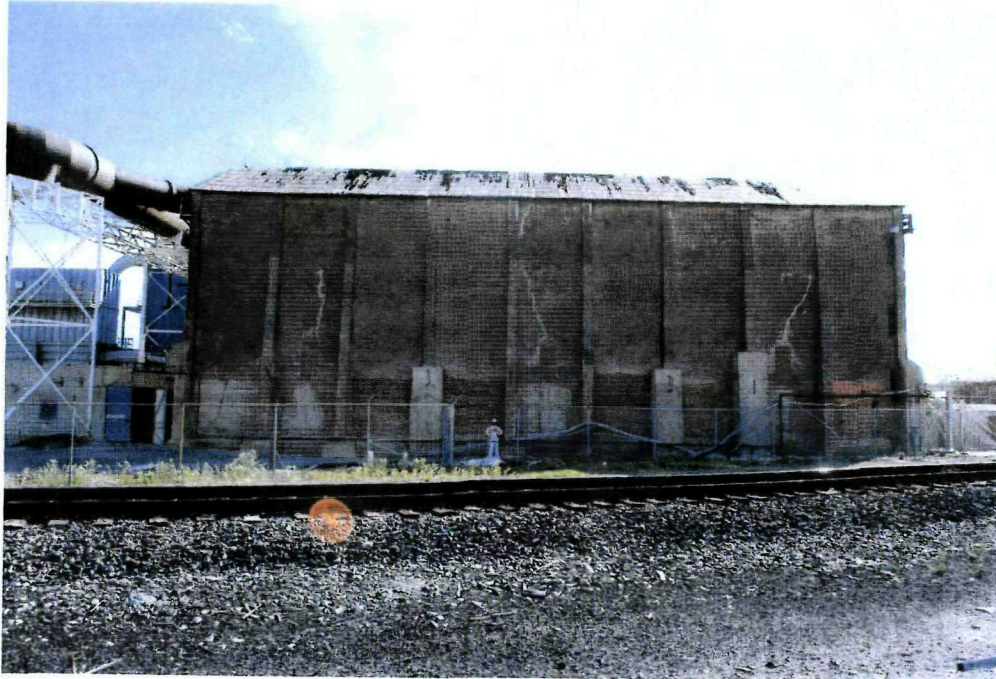


Figure C.33.50

Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing east northeast. Photograph taken by Brent Slensker, August 7, 2008. Photograph #235.

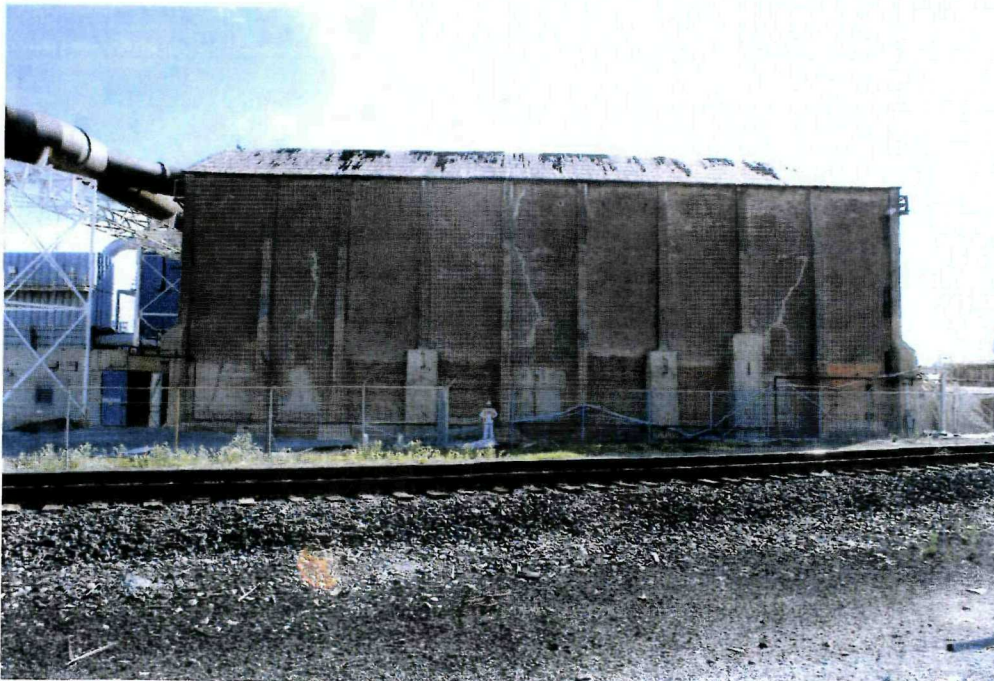




Figure C.33.51

**Blast Furnace Baghouses, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, August 8, 2008. Photograph #305. View of new exhaust flue connections.**





Figure C.34.1

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing west. Photograph taken by Brent Slensker, July 29, 2008. Photograph #50. View of context around Acid Plant, which is behind the other facilities.



Figure C.34.2

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing southwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #59.

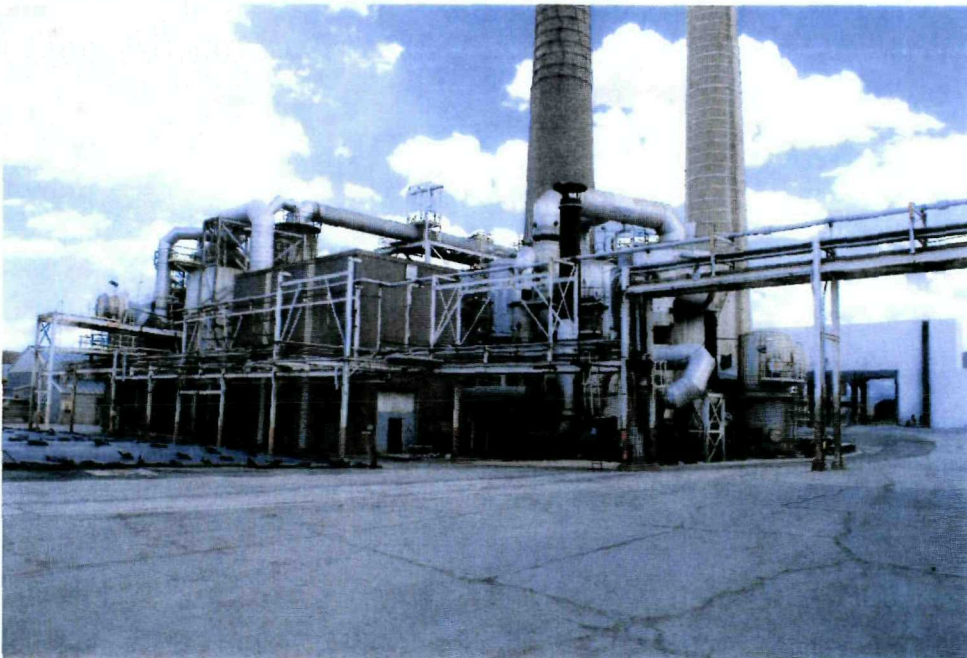




Figure C.34.3

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #69. Viewed through the Blast Furnace Flue vehicle underpass.

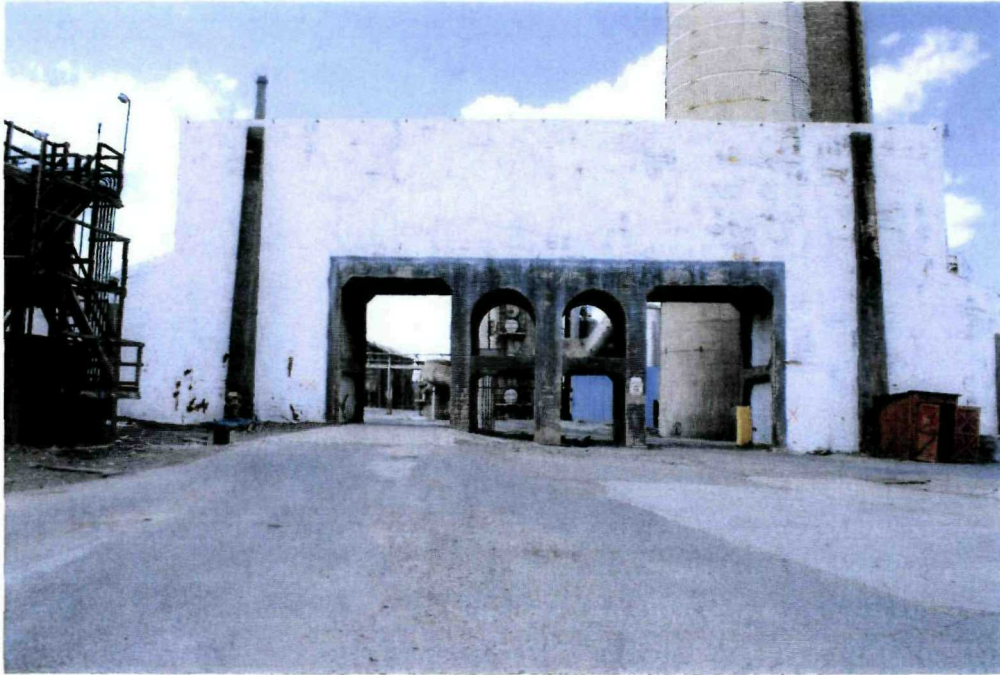


Figure C.34.4

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing north. Photograph taken by Brent Slensker, July 30, 2008. Photograph #92.





Figure C.34.5

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing southeast. Photograph taken by Brent Slensker, July 30, 2008. Photograph #137.



Figure C.34.6

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, July 29, 2008. Photograph #163. Brick building at right is Auto Shop-Cottrell Building.





Figure C.34.7

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing north northwest. Photograph taken by Brent Slensker, August 7, 2008. Photograph #226. View from Spray Dryer Building gantry.



Figure C.34.8

Acid Plant, East Helena Smelter, Lewis and Clark County, Montana, facing east. Photograph taken by Brent Slensker, August 8, 2008. Photograph #303. View of the blower mechanism and ducting.

